

Resolute

Director; Air, Pesticides, and Toxics Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue, Dallas, TX 75202

RECEIVED
US EPA, DALLAS, TX
ASSOCIATE DIRECTOR

18 JAN 29 AM 11:02

CORPORATE COMPLIANCE
ENFORCEMENT DIVISION

RE: NSPS Subpart OOOOa Annual Report

Company Name: Resolute Natural Resources Company, LLC.

1700 Lincoln Street, Suite 1950

Denver, Colorado 80203

Reporting Period: August 1, 2017 through July 31, 2018

Dear Sir or Madam,

This letter and the enclosed annual report are being submitted in duplicate pursuant to the requirements of Clean Air Act New Source Performance Standards (NSPS) located at 40 CFR Subpart OOOOa, §§ 60.4(a) and 60.5420(b), for oil and gas sites operated by Resolute Natural Resources Company, LLC. (Resolute or the Company). Resolute acknowledges the submission of this report now for the reporting period noted above is arguably later than required by the Subpart OOOOa regulations, which have been the subject of administrative stays and litigation challenging and vacating such stays at various times since being promulgated. Like many oil and gas operators, Resolute has struggled with the uncertainty caused by these various proposed rulemakings, stays, reconsiderations and court actions related to Subpart OOOOa. As a result, our efforts to implement some of the monitoring and recordkeeping procedures required by the rule have been delayed, and this submission reflects that. Resolute apologizes for any inconvenience due to the timing of this submission.

I. Enclosed Annual Report Specifics

The information required to be included in the annual report, according to paragraphs (b)(1) through (8) and (12) of § 60.5420a is set forth below and is followed by a brief explanation of the data provided.

§60.5420a(b)(1): A list of facility sites, including associated well IDs and a description of the site location with the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983 is included in Appendix 1. Except as noted for individual affected facilities, the report beginning and ending dates are as captioned above. A certification of truth, accuracy, and completeness, signed by a certifying official is also enclosed immediately following this letter.

§60.5420a(b)(2): A list of well affected facilities, including records of each well completion operation and records of any deviations during the report period, is included in Appendix 2.

§60.5420a(b)(3): Resolute does not operate any centrifugal compressor affected facilities.

§60.5420a(b)(4): A list of reciprocating compressor affected facilities is enclosed in Appendix 3 and includes the cumulative number of hours of operation or the number of months since initial startup or since the previous reciprocating compressor rod packing replacement.

§60.5420a(b)(5): Resolute does not operate any pneumatic device affected facilities subject to reporting. All continuous bleed pneumatic devices, regardless of bleed rate, at the covered facility sites are operated using instrument air.

§60.5420a(b)(6): A table listing storage vessel affected facilities, including the latitude and longitude coordinates of each storage vessel affected facility for which construction, modification or reconstruction commenced during the reporting period, is included in Appendix 4. The table includes a statement of compliance with the requirements specified in § 60.5410a(h)(2) and (3). Documentation of the VOC emission rate determination according to § 60.5365a(e) for each storage vessel that became an affected facility during the reporting period is included in Appendix 4a. No storage vessel affected facilities were removed from service or returned to service during the reporting period.

All the storage vessel affected facilities in Appendix 4 are equipped with a control device tested under §60.5413a(d) and certified by the manufacturer. The records specified in paragraphs (c)(5)(vi)(A) through (F) of §60.5420a are included to the extent they are available, including:

- (A) The make and model of each subject control device is listed in the table in Appendix 4. However, serial numbers for individual control devices are not included on the purchase orders and were not recorded during installation. Recording of the serial number after the device is in operation requires shutting the device down to ensure worker safety. We will be taking steps to record serial numbers for control devices during scheduled maintenance events for purposes of including such information in future annual reports.
- (B) The purchase date of each subject control device is listed in the table in Appendix 4.
- (C) A copy of the purchase order for each subject control device is included in Appendix 4c.
- (D) The location of each control device in latitude and longitude coordinates in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983 is included in the table in Appendix 4.
- (E) The inlet gas flow rate for each subject control device is listed in the table in Appendix 4.
- (F)(1) Appendix 4b includes trend files demonstrating pilot flame operation. Deviations from the requirement that the pilot flame is present at all times of operation are identified in the table in Appendix 4.
- (F)(2) Records that the subject control devices were operated with no visible emissions except for periods not to exceed a total of 1 minute during any 15 minute period are not included with this report. While the subject control devices are monitored daily for indications of malfunction, including visible emissions, we mistakenly believed that the use of a control device tested under §60.5413a(d) and certified by the manufacturer obviated the need for monthly Method 22 observations. We are now aware of this oversight and have taken steps to ensure that the required monthly observations are completed and properly documented.
- (F)(3) Maintenance and repair logs for the control devices are unavailable for much of the reporting period. The reasons for the absence of maintenance and repair logs is twofold. It was

our intent was to rely on the Company's maintenance call out and work order system to provide documentation of control device maintenance and repair. While a limited number of call outs were received for control device malfunctions requiring maintenance personnel or replacement part orders, much of the apparent control device pilot downtime was caused either by problems with the liquid knockouts that ensure liquid hydrocarbons are not sent to the control device or by data communication errors that caused the pilot monitor to indicate a pilot failure when the pilot was, in fact, still operating. All apparent pilot malfunctions caused by these issues were generally resolved by the facility operator and didn't generate a call out or work order. They were to be noted in the facility operator's daily notes in the Production Explorer production tracking software. Unfortunately, when Resolute migrated production tracking to Scout software in 2018, these notes were not successfully carried forward and were lost. A list of control device call outs is included in Appendix 4b.

(F)(4) Visible emissions tests following a return to operation from a maintenance or repair activity were apparently not completed during the reporting period. As stated in the response to (F)(2) above, Resolute mistakenly believed that the use of a control device tested under §60.5413a(d) and certified by the manufacturer obviated the need for Method 22 observations. The Company is now aware of this oversight and has taken steps to ensure that the required monthly observations are completed and properly documented.

(F)(5) A copy of the manual for the control device burner control module is included as Appendix 4d.

§60.5420a(b)(7): Survey data for sites with fugitive emissions components subject to reporting under §60.5420a(b)(7) are included in the table in Appendix 5;

§60.5420a(b)(8): There are no pneumatic device or pneumatic pump affected facilities subject to the reporting requirements of §60.5420a(b)(3), §60.5420a(b)(5), or §60.5420a(b)(8) at Resolute's oil and gas sites listed in Appendix 1.

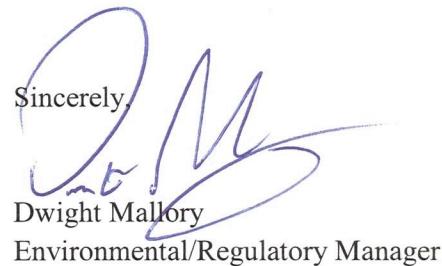
§60.5420a(b)(12): Certification signed by a qualified professional engineer according to § 60.5411a(d) for each closed vent system routing to a control device or process is not included with this report. Like many oil and gas operators, we relied on EPA's stated intent and issuance of a proposed rule to stay portions of NSPS OOOOa, including the requirement for PE certification of closed vent systems. We believe that our facilities are designed and constructed to the highest industry standards with respect to safety and emissions reduction. Our highly qualified engineering staff continuously evaluates the performance of our facilities, including closed vent systems. However, provided the considerable uncertainty surrounding this requirement, we have not yet invested the extensive time and capital necessary to obtain separate PE certifications specific to each closed vent system. We are aware of EPA's proposed amendments to the NSPS that would allow in-house engineers with appropriate expertise to evaluate designs of closed vent systems and certify that their design and capacity are sufficient, and we anticipate being able to complete such certification for our closed vent systems in a timely manner when the amendment is finalized.

II. General Comments of Resolute

Resolute takes its air quality compliance obligations very seriously, and is taking steps to improve the monitoring, recordkeeping and reporting issues reflected in this submission. The Company is committed to compliance with applicable NSPS and other air quality requirements, including Subpart OOOOa. Resolute is further committed to designing, constructing and operating its facilities so as to reduce their VOC and methane emissions.

This commitment is reflected in a number of more recent initiatives undertaken by Resolute to reduce emissions from its operations, including: 1) all Resolute well production facilities constructed after January 1, 2015, are equipped with vapor recovery units designed to recover at least 95% of the emissions from the crude oil storage tanks (VRUs remain in place as long as the volume of vapor produced is sufficient to operate the unit); 2) certified combustion control devices or air-assisted flares are installed for use during VRU maintenance or repair at all sites, and as primary control devices at sites without operating VRUs; 3) all Resolute well production facilities constructed after January 1, 2015, are equipped with instrument air systems in lieu of natural gas for powering continuous-bleed pneumatic devices; and 4) oil and produced water are transported offsite via pipeline wherever possible, thereby eliminating emissions from truck loadout and associated vehicle emissions, road dust, etc..

Please contact me at 303-573-4886, Ext 1165 with any questions or comments you may have on the enclosed annual report.

Sincerely,

Dwight Mallory
Environmental/Regulatory Manager

B. Certification of Truth, Accuracy and Completeness

I certify that, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) 

Name (typed) Patrick Flynn Date: 1 / 22 / 19

APPENDIX 1
Affected Facility Sites

SITE INFORMATION

AFFECTED FACILITIES AT SITE

Site ID	Associated Well ID	State	County	Location Description	Latitude	Longitude	Wells	Centrifugal Compressors	Pneumatic Compressors	Reciprocating Compressors	Pneumatic Devices	Storage Vessels	Fugitive Components	Pneumatic Pumps
Ace/Breckenridge Battery	42-389-355843 42-389-35589	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn right on lease road for 8 1/4 miles. Turn right 1/4 mile into location.	31.646390	-103.990400	X					X		
Boucher/Uinta Battery	42-389-355302 42-389-355339 42-389-36102 42-389-363557	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 4 1/2 miles. Turn left on County Rd 432 for 1 1/2 miles. Turn left into location.	31.648190	-103.813590	X					X		
Flying Dog/Iron City Battery	42-389-347733 42-389-355590	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn right on lease road for 5 miles. Location on right.	31.642030	-103.939070	X					X		
Harpoon/Great Divide Battery	42-389-342533 42-389-355530 42-389-34574	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn right on lease road for 5 miles. Location on right.	31.642030	-103.939070	X					X		
Harrison State Battery	42-389-33969 42-389-35365	TX	Reeves	From Orla South on US 285 for 13.5 miles. Turn left on lease road for 1.7 miles. Location on left.	31.692800	-103.770240	X					X		
Jolly/Long Yuengling Battery	42-389-34412 42-389-355849 42-389-35850	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn right on lease road for 3 1/4 miles. Turn right 1/4 mile into location.	31.645260	-103.914390	X					X		
North Appaloosa Central Battery	42-389-355142 42-389-355527 42-389-35130 42-389-355526 42-389-36172 42-389-36173 42-389-36242	TX	Reeves	From Orla South on US 285 for 13.9 miles. Turn left on lease road for 1.7 miles. Turn left on lease road for 1.5 miles. Location on right.	31.705320	-103.739210						X		X

SITE INFORMATION

AFFECTED FACILITIES AT SITE

Site ID	Associated Well ID	State	County	Location Description	Latitude	Longitude	Wells	Centrifugal Compressors	Reciprocating Compressors	Pneumatic Devices	Storage Vessels	Fugitive Components	Pneumatic Pumps
North Bronco Central Battery	42-389-34982 42-389-35346 42-389-35431 42-389-35440 42-389-35464 42-389-35563	TX	Reeves	From Orla South on US 285 for 5.2 miles. Turn left onto lease road for 2 miles. Turn right for 0.25 miles to location.	31.763290	-103.826290	X	X	X			X	
Pipeworks/Thunder Canyon Battery	42-389-35608 42-389-35631 42-389-35113 42-389-36335	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn left on lease road for 0.5 miles.	31.641180	-103.842400	X	X				X	
Ranger Battery	42-389-36241 42-389-36239 42-389-36240 42-389-36611 42-389-36610 42-389-35977 42-389-35976	TX	Reeves	From Orla, travel South on US-285 for 16.5 miles. Turn Northeast on County Road 428 for 1.2 miles. Turn South on Lease Road for 0.75 mile.	31.670330	-103.701390	X	X					
Renegade/Queen City/Steamworks Battery	42-389-34184 42-389-35487 42-389-35485 42-389-34236 42-389-35114 42-389-34632	TX	Reeves	From Pecos North on US-285 for 28 miles. Turn left on County Rd 232 for 5 miles. Turn left on lease road for 0.25 miles.	31.641510	-103.844200	X	X				X	
South Appaloosa Central Battery	42-389-35494 42-389-35144 42-389-35200 42-389-35102 42-389-35937 42-389-35119 42-389-35449	TX	Reeves	FROM MENTONE SOUTH ON TX 302 5.3 MILES RIGHT ON US 285 FOR 4.5 MILES RIGHT ON RD 428 FOR 1.2 MILES RIGHT INTO LOCATION	31.6778280	-103.709570	X	X				X	
South Bronco Central Battery	42-389-35584 42-389-35609	TX	Reeves	From Orla South on US 285 for 8.4 miles. Left on Co Rd 433 for 0.5 miles. Tank battery on right, compressor on left.	31.725900	-103.807560	X	X	X			X	X

SITE INFORMATION

AFFECTED FACILITIES AT SITE

Code	Longitude	Wells	Centrifugal Compressors	Reciprocating Compressors	Pneumatic Devices	Storage Vessels	Fugitive Components	Pneumatic Pumps
1240	-103.871370						X	X

APPENDIX 2
Well Affected Facilities

U.S. Well Number	Completion ID	Latitude	Longitude	Low Pressure Well?	Onset of Flowback Date	Onset of Flowback Time	Date Attempted to Turn Through Separator	Attempted to Turn Through Separator	Date Returned to Initial Flowback Stage	Time Flowback Equipment Removed	Disposition of Gas Recovered	Combustion Hours	Venting Hours
42-389-36102	Uinta L04H	31.649680	-103.817080	No	8/4/2017	1:40 PM	8/7/2017, 8:00 AM, 8/10/2017, 8:50 AM, 8/12/2017 12:00 PM	8/7/2017, 11:00 AM, 8/8/2017, 8:50 AM, 8/10/2017, 9:00 AM	8/15/2017	7:00 PM, 3:00 AM, 9:00 AM	262	111 flow line to production facility	52
42-389-359577	Ranger L07H	31.664110	-103.701570	No	9/5/2017	2:00 PM	9/10/2017	3:00 PM					38
42-389-359576	Ranger B106H	31.663820	-103.701570	No	9/5/2017	2:00 PM	9/10/2017	3:00 PM					61
42-389-359537	North Goat 2 Unit B101SL	31.680690	-103.712100	No	9/15/2017	3:00 AM	9/22/2017	7:10 AM					27
42-389-358483	Ace L06H	31.649020	-103.992010	No	10/2/2017	10:00 PM	10/9/2017	2:00 PM					0
42-389-36172	South Elephant B307SL	31.703040	-103.738210	No	11/5/2017	4:00 AM	11/10/2017	7:00 PM					44
42-389-36173	South Elephant C207SL	31.703090	-103.738250	No	11/5/2017	4:00 AM	11/11/2017	5:00 PM					0
42-389-358550	Long Yeungling L03H	31.642820	-103.909550	No	11/21/2017	3:20 PM	11/26/2017	8:10 AM					0
42-389-358489	Long Yeungling U04H	31.642830	-103.909450	No	11/21/2017	3:20 PM	11/26/2017	7:00 PM					0
42-389-363557	Uinta C101H	31.650110	-103.820840	No	1/26/2018	12:00 PM	1/31/2018	6:00 PM					20
42-389-363335	Thunder Canyon C107SL	31.650110	-103.820930	No	3/19/2018	2:30 AM	3/23/2018	9:00 AM					0
42-389-36241	Ranger U06SL	31.664540	-103.701910	No	4/23/2018	12:30 PM	4/26/2018	7:00 PM					0
42-389-36239	Ranger L05H	31.664610	-103.701970	No	4/23/2018	12:30 PM	4/26/2018	12:00 PM					0
42-389-36240	Ranger C205SL	31.664680	-103.702020	No	4/23/2018	12:30 PM	4/25/2018	2:15 PM					0
42-389-36242	North Elephant 2 Unit C201SL	31.712870	-103.746290	No	5/19/2018	8:45 PM	5/25/2018	12:00 PM					0
42-389-36610	Ranger L03H	31.665740	-103.702850	No	5/28/2018	11:45 AM	5/31/2018	9:15 AM					0
42-389-36608	Ranger L01H	31.667240	-103.704020	No	5/28/2018	8:40 AM	5/29/2018	9:00 AM					0
42-389-36609	Ranger U02H	31.667200	-103.703980	No	5/31/2018	5:00 PM	6/3/2018	2:00 PM					0
42-389-36611	Ranger U04H	31.665700	-103.702810	No	6/3/2018	5:30 PM	6/9/2018	1:15 PM					0
42-389-36620	Ranger B102SL	31.667150	-103.703940	No	6/6/2018	4:00 PM	6/9/2018	9:30 AM					0
42-389-36622	Ranger B104SL	31.665650	-103.702740	No	6/8/2018	2:30 AM	6/11/2018	1:00 PM					0
42-389-36474	Sandlot State B101SL	31.626560	-103.878420	No	7/6/2018	4:00 PM	7/18/2018	1:00 PM					6
42-389-36701	Sandlot State L06H	31.626190	-103.8774150	No	7/7/2018	10:00 PM	7/13/2018	1:00 PM					0
42-389-36703	Sandlot State B105SL	31.626190	-103.874240	No	7/7/2018	10:00 PM	7/13/2018	2:00 PM					0
42-389-36699	Sandlot State U05H	31.626190	-103.874340	No	7/7/2018	10:00 PM	7/12/2018	6:00 PM					0
42-389-36672	Sandlot State U01H	31.626560	-103.878420	No	7/8/2018	3:00 PM	7/13/2018	3:00 PM					0
42-389-36477	Sandlot State L02H	31.626560	-103.878420	No	7/11/2018	1:00 AM	7/14/2018	2:00 AM					0
42-389-36696	Sandlot State L04H	31.626170	-103.876270	No	7/11/2018	12:00 AM	7/18/2018	8:00 AM					0
42-389-36698	Sandlot State B103SL	31.626160	-103.876360	No	7/11/2018	2:00 PM	7/18/2018	4:00 PM					0
42-389-36694	Sandlot State U03H	31.626160	-103.876460	No	7/11/2018	8:00 PM	7/18/2018	4:00 PM					0

U.S. Well Number	Completion ID	Latitude	Longitude	Low Pressure Well?	Onset of Flowback Date	Onset of Flowback Time	Date Attempted to Turn Through Separator	Time Attempted to Turn Through Separator	Date Returned to Initial Flowback Stage	Time Returned to Initial Flowback Stage	Date Flowback Equipment Removed	Time Flowback Equipment Removed	Disposition of Gas Recovered	Combustion Hours	Venting Hours
42-389-36102	Uinta L04H	31.649680	-103.817080	No	8/4/2017	1:40 PM	8/7/2017, 8/10/2017, 8/12/2017	7:00 PM, 11:00 AM, 8:50 AM, 12:00 PM	8/15/2017, 8/10/2017, 8/12/2017	11:15 AM	8/15/2017, 3:00 AM, 9:00 AM	262	111	flow line to production facility	
42-389-35977	Ranger L07H	31.664110	-103.701570	No	9/5/2017	2:00 PM	9/10/2017	3:00 PM	9/26/2017	5:00 AM	9/26/2017	5:00 AM, 5:00 AM	496	375	flow line to production facility
42-389-35976	Ranger B106H	31.663820	-103.701570	No	9/5/2017	2:00 PM	9/10/2017	3:00 PM	9/26/2017	5:00 AM	9/26/2017	5:00 AM	495	374	flow line to production facility
42-389-35937	North Goat 2 Unit B101SL	31.680690	-103.712100	No	9/15/2017	3:00 AM	9/22/2017	7:10 AM	10/6/2017	5:00 AM	506	334	flow line to production facility	38	0
42-389-35843	Ace L06H	31.649020	-103.992010	No	10/2/2017	10:00 PM	10/9/2017	2:00 PM	10/24/2017	5:00 AM	512	352	flow line to production facility	61	0
42-389-36172	South Elephant B307SL	31.703040	-103.738210	No	11/5/2017	4:00 AM	11/10/2017	7:00 PM	11/25/2017	5:00 AM	481	346	flow line to production facility	45	0
42-389-36173	South Elephant C207SL	31.703090	-103.738250	No	11/5/2017	4:00 AM	11/11/2017	5:00 PM	11/29/2017	5:00 AM	577	420	flow line to production facility	0	0
42-389-35850	Long Yeungling L03H	31.642820	-103.909550	No	11/21/2017	3:20 PM	11/26/2017	8:10 AM	12/9/2017	5:00 AM	423	235	flow line to production facility	15	0
42-389-35849	Long Yeungling U04H	31.642830	-103.909450	No	11/21/2017	3:20 PM	11/26/2017	7:00 PM	12/9/2017	5:00 AM	423	224	flow line to production facility	12	0
42-389-36357	Uinta C101H	31.650110	-103.820840	No	1/26/2018	12:00 PM	1/31/2018	6:00 PM	2/14/2018	5:00 AM	449	323	flow line to production facility	20	0
42-389-36335	Thunder Canyon C107SL	31.650110	-103.820930	No	3/19/2018	2:30 AM	3/23/2018	9:00 AM	4/4/2018	5:00 AM	387	284	flow line to production facility	0	0
42-389-36241	Ranger U06SL	31.664540	-103.701910	No	4/23/2018	12:30 PM	4/26/2018	7:00 PM	6/9/2018	8:00 PM	1136	1057	flow line to production facility	3	0
42-389-36239	Ranger L05H	31.664610	-103.701970	No	4/23/2018	12:30 PM	4/26/2018	12:00 PM	6/9/2018	5:00 PM	1121	1049	flow line to production facility	4	0
42-389-36240	Ranger C205SL	31.664680	-103.702020	No	4/23/2018	12:30 PM	4/25/2018	2:15 PM	6/9/2018	5:00 AM	1120	1071	flow line to production facility	0	0
42-389-36242	North Elephant 2 Unit C201SL	31.712870	-103.746290	No	5/19/2018	8:45 PM	5/25/2018	12:00 PM	6/9/2018	5:00 AM	488	353	flow line to production facility	0	0
42-389-36610	Ranger L03H	31.665740	-103.702850	No	5/28/2018	11:45 AM	5/31/2018	9:15 AM	6/19/2018	5:00 AM	521	452	flow line to production facility	22	0
42-389-36608	Ranger L01H	31.667240	-103.704020	No	5/28/2018	8:40 AM	5/29/2018	9:00 AM	6/19/2018	5:00 AM	524	500	flow line to production facility	155	0
42-389-36609	Ranger U02H	31.667200	-103.703980	No	5/31/2018	5:00 PM	6/3/2018	2:00 PM	6/19/2018	5:00 AM	444	375	flow line to production facility	0	0
42-389-36611	Ranger U04H	31.665700	-103.702810	No	6/3/2018	5:30 PM	6/9/2018	1:15 PM	6/19/2018	5:00 AM	372	232	flow line to production facility	0	0
42-389-36620	Ranger B102SL	31.6667150	-103.703940	No	6/6/2018	4:00 PM	6/9/2018	9:30 AM	6/19/2018	5:00 AM	301	236	flow line to production facility	0	0
42-389-36622	Ranger B104SL	31.665650	-103.702780	No	6/8/2018	2:30 AM	6/11/2018	1:00 PM	6/19/2018	5:00 AM	267	184	flow line to production facility	0	0
42-389-36474	Sandlot State B101SL	31.626560	-103.878420	No	7/6/2018	4:00 PM	7/18/2018	1:00 PM	7/31/2018	5:00 AM	457	316	flow line to production facility	6	0
42-389-36701	Sandlot State L06H	31.626190	-103.874150	No	7/7/2018	10:00 PM	7/13/2018	1:00 PM	7/31/2018	5:00 AM	559	424	flow line to production facility	0	0
42-389-36703	Sandlot State B105SL	31.626190	-103.874240	No	7/7/2018	10:00 PM	7/13/2018	2:00 PM	7/31/2018	5:00 AM	559	423	flow line to production facility	0	0
42-389-36699	Sandlot State U05H	31.626190	-103.874340	No	7/7/2018	10:00 PM	7/12/2018	6:00 PM	7/31/2018	5:00 AM	559	443	flow line to production facility	25	0
42-389-36672	Sandlot State U01H	31.626560	-103.878420	No	7/8/2018	3:00 PM	7/13/2018	3:00 PM	7/31/2018	5:00 AM	544	422	flow line to production facility	7	0
42-389-36477	Sandlot State L02H	31.626170	-103.876270	No	7/11/2018	1:00 AM	7/14/2018	3:00 PM	7/19/2018	10:00 PM	515	414	flow line to production facility	7	0
42-389-36696	Sandlot State L04H	31.626170	-103.876270	No	7/11/2018	12:00 AM	7/18/2018	8:00 AM	7/21/2018	12:00 PM	471	333	flow line to production facility	51	0
42-389-36698	Sandlot State B103SL	31.626160	-103.876360	No	7/11/2018	2:00 PM	7/18/2018	4:00 PM	7/23/2018	1:00 PM	510	339	flow line to production facility	79	0
42-389-36694	Sandlot State U03H	31.626160	-103.876460	No	7/11/2018	8:00 PM	7/18/2018	4:00 PM	8/2/2018	5:00 AM	513	349	flow line to production facility	76	0

APPENDIX 3
Reciprocating Compressor Affected Facilities

RECIPROCATING COMPRESSORS

Compressor Site	Compressor ID	Rod Packing Closed Vent?	Hours of Operation Since Startup or Rod Packing Replacement
North Bronco Central Battery	North Bronco-C1	No	6,537
North Bronco Central Battery	North Bronco-C2	No	1,404
North Bronco Central Battery	North Bronco-C3	No	2,080
North Bronco Central Battery	North Bronco-C4	No	5,127
South Bronco Central Battery	South Bronco C-1	No	2,301
South Bronco Central Battery	South Bronco C-2	No	6,697
South Bronco Central Battery	South Bronco C-3	No	8,820

APPENDIX 4
Storage Tank Affected Facilities

STORAGE VESSELS

Storage Vessel ID	Latitude	Longitude	New or Modified Source	Uncontrolled VOC Emission Rate	Report Period	Deviations where the storage vessel was not operated in compliance with control requirements	Compliance with control requirements specified in §60.541(b)(2) and (3)	Removed from service?	Make/Model of Control Device	Serial Number of Control Device	Inlet Flow Rate	Date of Purchase
FLYING DOG OT-1	31.642030	-103.939070	modified - VRU shutdown	8.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
FLYING DOG OT-2	31.642030	-103.939070	modified - VRU shutdown	8.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
FLYING DOG OT-3	31.642030	-103.939070	modified - VRU shutdown	8.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
FLYING DOG OT-4	31.642030	-103.939070	modified - VRU shutdown	8.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
IRON CITY OT-1	31.642030	-103.939070	modified - VRU shutdown	22.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
IRON CITY OT-2	31.642030	-103.939070	modified - VRU shutdown	22.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
IRON CITY OT-3	31.642030	-103.939070	modified - VRU shutdown	22.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951542	3.63 mscfd	5/2/2017
HARPOON OT-4	31.642030	-103.939070	modified - VRU shutdown	22.7 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 8 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 94.1% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	Yes	National Oil Well Varco MVEC100	See Purchase Order No. 3553325	2.42 mscfd	1/13/2016
HARPOON OT-1	31.642030	-103.939070	modified - VRU shutdown	12.7 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 7 deviations as shown in the enclosed HarpoonPilot.xlsx. The combustion control device achieved 98.4% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3553325	2.42 mscfd	1/13/2016
HARPOON OT-2	31.642030	-103.939070	modified - VRU shutdown	12.7 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 7 deviations as shown in the enclosed HarpoonPilot.xlsx. The combustion control device achieved 98.4% run-time.	The control device installed in accordance with §60.5410(a)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 93.2%, which is less than the 95% control required by §60.5410(a)(2) and §60.5395(a).	Yes	National Oil Well Varco MVEC100	See Purchase Order No. 3553325	2.42 mscfd	1/13/2016

STORAGE VESSELS							Compliance with control requirements specified in §60.541(b)(h)(2) and (3)					
Storage Vessel ID	Latitude	Longitude	New or Modified Source	Uncontrolled VOC Emission Rate	Report Period	Deviations where the storage vessel was not operated in compliance with control requirements	Removed from service?	Make/Model of Control Device	Serial Number of Control Device	Inlet Flow Rate	Date of Purchase	
HARPOON OT-3	31.642030	-103.939070	modified - VRU shutdown	12.7 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 7 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 98.4% run-time.	Yes	National Oil Well Varco MVEC100	See Purchase Order No. 3553325	2.42 mscf/d	1/13/2016	
HARPOON OT-4	31.642030	-103.939070	modified - VRU shutdown	12.7 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were 7 deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 98.4% run-time.	Yes	National Oil Well Varco MVEC100	See Purchase Order No. 3553325	2.42 mscf/d	1/13/2016	
HARRISON OT-1	31.692800	-103.770240	modified - VRU shutdown	29.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 84.8% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 83.9%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3482183	3.25 mscf/d	10/30/2015
HARRISON OT-2	31.692800	-103.770240	modified - VRU shutdown	29.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 84.8% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 83.9%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3482183	3.25 mscf/d	10/30/2015
HARRISON OT-3	31.692800	-103.770240	modified - VRU shutdown	29.5 tpy	From 8/1/2017 through 12/12/2017 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	There were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 84.8% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 83.9%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3482183	3.25 mscf/d	10/30/2015
NORTH ELEPHANT WT-1	31.705320	-103.739210	modified - Water Tank disconnected from VRU	8.1 tpy	The report period is 8/1/2017 through 7/31/2018.	There were deviations as shown in the enclosed pilot monitoring trend. The combustion control devices achieved a combined 87.2% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 86.3%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867264	2.2 mscf/d	3/17/2017
SOUTH ELEPHANT WT-1	31.705320	-103.739210	modified - Water Tank disconnected from VRU	15.6 tpy	The report period is 8/1/2017 through 7/31/2018.	There were deviations as shown in the enclosed pilot monitoring trend. The combustion control devices achieved a combined 87.2% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 86.3%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867264	2.2 mscf/d	3/17/2017
NORTH BRONCO WT-1	31.763290	-103.826290	modified - Water Tank disconnected from VRU	8.1 tpy	The report period is 8/8/2017 through 7/31/2018.	During the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 91.6% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 89.8%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC100	See Purchase Order No. 3951541	2.3 mscf/d	5/2/2017
RENEGADE OT-1	31.641510	-103.844200	modified - VRU shutdown	25.2 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 78.1%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 mscf/d	3/17/2017
RENEGADE OT-2	31.641510	-103.844200	modified - VRU shutdown	25.2 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	The control device installed in accordance with §60.5410a(h)(3) had malfunctions that prevented operation 100% of the time. The effective control efficiency after accounting for control device malfunctions was 78.1%, which is less than the 95% control required by §60.5410a(h)(2) and §60.5395(a).	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 mscf/d	3/17/2017

STORAGE VESSELS							Compliance with control requirements specified in §60.541(a)(2) and (3)				
Storage Vessel ID	Latitude	Longitude	New or Modified Source	Uncontrolled VOC Emission Rate	Report Period	Deviations where the storage vessel was not operated in compliance with control requirements	Removed from service?	Make/Model of Control Device	Serial Number of Control Device	Inlet Flow Rate	Date of Purchase
RENEGADE OT-3	31.641510	-103.844200	modified - VRU shutdown	25.2 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 msfcfd	3/17/2017
STEAMWORKS OT-1	31.641510	-103.844200	modified - VRU shutdown	16.9 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 msfcfd	3/17/2017
STEAMWORKS OT-2	31.641510	-103.844200	modified - VRU shutdown	16.9 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 msfcfd	3/17/2017
STEAMWORKS OT-3	31.641510	-103.844200	modified - VRU shutdown	16.9 tpy	From 8/1/2017 through 1/11/2018 the tank was operated with a VRU and was not an affected facility. The report period ended on 7/31/2018.	From 1/12/2018 through the end of the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 79.7% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867261	6.7 msfcfd	3/17/2017
NORTH GOAT WT-1	31.678280	-103.709570	modified - Water Tank disconnected from VRU	7 tpy	The report period is 8/1/2017 through 7/31/2018.	During the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 90.5% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3867262	1.6 msfcfd	3/17/2017
SOUTH BRONCO WT-1	31.725900	-103.807560	modified - Water Tank disconnected from VRU	7.2 tpy	The report period is 8/1/2017 through 7/31/2018.	During the report period, there were deviations as shown in the enclosed pilot monitoring trend. The combustion control device achieved 90.6% run-time.	No	National Oil Well Varco MVEC200	See Purchase Order No. 3951541	2 msfcfd	6/6/2017

APPENDIX 4a
Storage Tank Emissions Determinations

```
*****
* Project Setup Information *
*****
Project File      : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\0000 Determinations\FDogRY18.ept
Flowsheet Selection : Oil Tank with Separator
Calculation Method   : AP42
Control Efficiency    : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group       : C10+

Filed Name          : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi Separator
Well Name            : Flying Dog Battery Tanks OT-1 through OT-4
Date                : 8/30/2018

*****
* Data Input *
*****
Separator Pressure (psia)      : 55.00
Separator Temperature (F)        : 112.0
C10+ SG                         : 0.83
C10+ MW(lb/lbmol)               : 244.20

-- Low Pressure Oil --
No. Component      Mole%   Wt%
1   H2S             0.0000  0.0000
2   O2              0.0000  0.0000
3   CO2             0.0080  0.0021
4   N2              0.0180  0.0030
5   C1              1.5020  0.1435
6   C2              1.2090  0.2165
7   C3              1.9110  0.5018
8   i-C4             0.5960  0.2063
9   n-C4             2.3410  0.8101
10  i-C5             1.4700  0.6315
11  n-C5             2.5010  1.0744
12  C6              2.2640  1.1615
13  C7              10.2539 6.1177
14  C8              13.6989 9.3174
15  C9              7.5709  5.7828
16  C10+            48.5504 70.5942
17  Benzene          0.2050  0.0953
18  Toluene          1.0260  0.5628
19  E-Benzene        0.2820  0.1783
20  Xylenes          2.0500  1.2959
21  n-C6             2.5430  1.3049
22  224Trimethylp    0.0000  0.0000

-- Sales Oil --
Production Rate (bbl/day)      : 57.00
Days of Annual Operation       : 365
API Gravity                    : 49.00
Reid Vapor Pressure (psia)     : 6.38
Bulk Temperature                : 75.0

-- Tank and Shell Data --
Diameter (ft)                  : 21.00
Shell Height (ft)                : 16.00
Cone Roof Slope                 : 0.06
Average Liquid Height (ft)       : 10.00
Vent Pressure Range (psia)      : 0.50
Solar Absorbance                 : 0.54

-- Meteorological Data --
```

City : Midland/Odessa, TX
 Min Ambient Temperature (F) : 49.9
 Max Ambient Temperature (F) : 77.0
 Total Solar Insolation (F) : 1802.00
 Ambient Pressure (psia) : 14.73
 Ambient Temperature (F) : 80.0

 * Calculation Results *

-- Emission Summary -----

	Uncontrolled	Controlled
	ton	ton
Total HAPs	0.3540	0.0071
Total HC	15.1890	0.3038
VOCs, C2+	11.7780	0.2356
VOCs, C3+	8.4630	0.1693
CO2	0.0430	
CH4	3.4110	

Uncontrolled Recovery Information:

Vapor(mscfd) : 0.9964
 HC Vapor(mscfd) : 0.9883
 CO2(mscfd) : 0.0000
 CH4(mscfd) : 0.4400
 GOR(SCF/STB) : 17.4814

-- Emission Composition -----

NoComponent	Uncontrolled	Controlled
	ton	ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.0430	0.0430
4 N2	0.0820	0.0820
5 C1	3.4110	0.0682
6 C2	3.3150	0.0663
7 C3	3.4890	0.0698
8 i-C4	0.6730	0.0135
9 n-C4	1.8690	0.0374
10 i-C5	0.5950	0.0119
11 n-C5	0.7610	0.0152
12 C6	0.2500	0.0050
13 Benzene	0.0180	0.0004
14 Toluene	0.0300	0.0006
15 E-Benzene	0.0030	0.0001
16 Xylenes	0.0200	0.0004
17 n-C6	0.2840	0.0057
18 224Trimethylp	0.0000	0.0000
19 Pseudo Compl	0.4570	0.0091
20 Pseudo Comp2	0.0160	0.0003
21 Pseudo Comp3	0.0000	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	15.3160	0.3063

-- Stream Data -----

NoComponent	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
	lb/lbmol	mole %	mole %	mole %	mole %	mole %	mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0080	0.0027	0.0003	0.2176	0.0974	0.2031
4 N2	28.01	0.0180	0.0009	0.0000	0.6927	0.0003	0.6091
5 C1	16.04	1.5020	0.2659	0.0000	50.3998	0.0002	44.3164
6 C2	30.07	1.2090	0.6858	0.3001	21.9055	30.7545	22.9736
7 C3	44.10	1.9110	1.6031	1.2869	14.0910	33.9367	16.4865

8 i-C4	58.12	0.5960	0.5605	0.5169	2.0002	5.4106	2.4119
9 n-C4	58.12	2.3410	2.2605	2.1481	5.5262	15.2753	6.7029
10 i-C5	72.15	1.4700	1.4716	1.4545	1.4074	3.9817	1.7181
11 n-C5	72.15	2.5010	2.5187	2.5054	1.8002	5.0998	2.1985
12 C6	84.00	2.2640	2.3084	2.3260	0.5085	1.4331	0.6201
13 Benzene	78.11	0.2050	0.2092	0.2110	0.0387	0.1094	0.0473
14 Toluene	92.14	1.0260	1.0505	1.0631	0.0551	0.1535	0.0670
15 E-Benzene	106.17	0.2820	0.2890	0.2927	0.0051	0.0140	0.0062
16 Xylenes	106.17	2.0500	2.1010	2.1283	0.0319	0.0872	0.0386
17 n-C6	86.18	2.5430	2.5930	2.6130	0.5634	1.5879	0.6871
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Compl	106.78	31.5237	32.3020	32.7138	0.7385	2.0116	0.8922
20 Pseudo Comp2	152.19	18.6156	19.0858	19.3396	0.0179	0.0464	0.0213
21 Pseudo Comp3	217.52	13.5813	13.9246	14.1101	0.0002	0.0005	0.0002
22 Pseudo Comp4	302.28	10.1407	10.3970	10.5356	0.0000	0.0000	0.0000
23 Pseudo Comp5	481.86	6.2127	6.3697	6.4547	0.0000	0.0000	0.0000
MW (lb/lbmol):		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
		165.83	169.27	170.56	29.71	47.96	31.92
Stream Mole Ratio:		1.0000	0.9753	0.9720	0.0247	0.0034	0.0280
Stream Weight Ratio:		165.83	165.09	165.78	0.73	0.16	0.89
Total Emission (ton):					12.536	2.778	15.313
Heating Value (BTU/scf):					1724.62	2710.19	1843.59
Gas Gravity (Gas/Air):					1.03	1.66	1.10
Bubble Pt. @100F (psia):	60.83	17.41	6.42				
RVP @100F (psia):	96.08	49.21	32.82				
Spec. Gravity @100F:	0.77	0.77	0.77				

```
*****
* Project Setup Information *
*****
Project File      : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\0000 Determinations\IronCityRY18.
Flowsheet Selection : Oil Tank with Separator
Calculation Method   : AP42
Control Efficiency    : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group     : C10+

Filed Name          : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi Separator
Well Name           : Iron City Battery Tanks OT-1 through OT-4
Date                : 8/30/2018

*****
* Data Input *
*****
Separator Pressure (psia)      : 55.00
Separator Temperature (F)       : 112.0
C10+ SG                         : 0.83
C10+ MW(lb/lbmol)              : 244.20

-- Low Pressure Oil -----
No. Component        Mole%   Wt%
1    H2S             0.0000  0.0000
2    O2              0.0000  0.0000
3    CO2             0.0080  0.0021
4    N2              0.0180  0.0030
5    C1              1.5020  0.1435
6    C2              1.2090  0.2165
7    C3              1.9110  0.5018
8    i-C4             0.5960  0.2063
9    n-C4             2.3410  0.8101
10   i-C5             1.4700  0.6315
11   n-C5             2.5010  1.0744
12   C6              2.2640  1.1615
13   C7              10.2539 6.1177
14   C8              13.6989 9.3174
15   C9              7.5709  5.7828
16   C10+            48.5504 70.5942
17   Benzene          0.2050  0.0953
18   Toluene          1.0260  0.5628
19   E-Benzene         0.2820  0.1783
20   Xylenes          2.0500  1.2959
21   n-C6             2.5430  1.3049
22   224Trimethylp    0.0000  0.0000

-- Sales Oil -----
Production Rate (bbl/day)   : 180.00
Days of Annual Operation    : 365
API Gravity                 : 49.00
Reid Vapor Pressure (psia)  : 6.38
Bulk Temperature             : 75.0

-- Tank and Shell Data -----
Diameter (ft)               : 21.00
Shell Height (ft)            : 16.00
Cone Roof Slope              : 0.06
Average Liquid Height (ft)   : 10.00
Vent Pressure Range (psia)   : 0.50
Solar Absorbance             : 0.54

-- Meteorological Data -----
```

City : Midland/Odessa, TX
 Min Ambient Temperature (F) : 49.9
 Max Ambient Temperature (F) : 77.0
 Total Solar Insolation (F) : 1802.00
 Ambient Pressure (psia) : 14.73
 Ambient Temperature (F) : 80.0

 * Calculation Results *

-- Emission Summary -----

	Uncontrolled ton	Controlled ton
Total HAPs	0.9210	0.0184
Total HC	43.8400	0.8768
VOCs, C2+	32.3800	0.6476
VOCs, C3+	22.4570	0.4491
CO2	0.1410	
CH4	11.4600	

Uncontrolled Recovery Information:

Vapor(mscfd) : 3.0400
 HC Vapor(mscfd) : 3.0200
 CO2(mscfd) : 0.0100
 CH4(mscfd) : 1.4800
 GOR(SCF/STB) : 16.8889

-- Emission Composition -----

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.1410	0.1410
4 N2	0.2600	0.2600
5 C1	11.4600	0.2292
6 C2	9.9220	0.1984
7 C3	9.4580	0.1892
8 i-C4	1.7720	0.0354
9 n-C4	4.8960	0.0979
10 i-C5	1.5470	0.0309
11 n-C5	1.9780	0.0396
12 C6	0.6500	0.0130
13 Benzene	0.0460	0.0009
14 Toluene	0.0770	0.0015
15 E-Benzene	0.0080	0.0002
16 Xylenes	0.0510	0.0010
17 n-C6	0.7380	0.0148
18 224Trimethylp	0.0000	0.0000
19 Pseudo Compl	1.1940	0.0239
20 Pseudo Comp2	0.0410	0.0008
21 Pseudo Comp3	0.0010	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	44.2400	0.8848

-- Stream Data -----

NoComponent	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0080	0.0027	0.0015	0.2176	0.2326	0.2189
4 N2	28.01	0.0180	0.0009	0.0000	0.6927	0.0005	0.6329
5 C1	16.04	1.5020	0.2659	0.0625	50.3998	31.6583	48.7790
6 C2	30.07	1.2090	0.6858	0.5556	21.9055	29.0995	22.5276
7 C3	44.10	1.9110	1.6031	1.5207	14.0910	20.4717	14.6428

8 i-C4	58.12	0.5960	0.5605	0.5504	2.0002	2.9432	2.0818
9 n-C4	58.12	2.3410	2.2605	2.2364	5.5262	8.1283	5.7512
10 i-C5	72.15	1.4700	1.4716	1.4701	1.4074	2.0598	1.4638
11 n-C5	72.15	2.5010	2.5187	2.5201	1.8002	2.6263	1.8716
12 C6	84.00	2.2640	2.3084	2.3170	0.5085	0.7323	0.5279
13 Benzene	78.11	0.2050	0.2092	0.2100	0.0387	0.0558	0.0402
14 Toluene	92.14	1.0260	1.0505	1.0556	0.0551	0.0783	0.0571
15 E-Benzene	106.17	0.2820	0.2890	0.2905	0.0051	0.0071	0.0053
16 Xylenes	106.17	2.0500	2.1010	2.1116	0.0319	0.0445	0.0330
17 n-C6	86.18	2.5430	2.5930	2.6028	0.5634	0.8111	0.5849
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Comp1	106.78	31.5237	32.3020	32.4630	0.7385	1.0267	0.7634
20 Pseudo Comp2	152.19	18.6156	19.0858	19.1835	0.0179	0.0238	0.0184
21 Pseudo Comp3	217.52	13.5813	13.9246	13.9960	0.0002	0.0002	0.0002
22 Pseudo Comp4	302.28	10.1407	10.3970	10.4504	0.0000	0.0000	0.0000
23 Pseudo Comp5	481.86	6.2127	6.3697	6.4024	0.0000	0.0000	0.0000
MW (lb/lbmol) :		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
Stream Mole Ratio:		165.83	169.27	169.64	29.71	35.39	30.20
Stream Weight Ratio:		1.0000	0.9753	0.9730	0.0247	0.0023	0.0270
Total Emission (ton) :		165.83	165.09	165.07	0.73	0.08	0.82
Heating Value (BTU/scf) :					39.757	4.483	44.241
Gas Gravity (Gas/Air) :					1724.62	2038.91	1751.80
Bubble Pt. @100F (psia) :	60.83	17.41	10.23			1.03	1.22
RVP @100F (psia) :	96.08	49.21	41.24				
Spec. Gravity @100F:	0.77	0.77	0.77				

```
*****
* Project Setup Information *
*****
Project File      : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\0000 Determinations\HarpoonRY18.e
Flowsheet Selection : Oil Tank with Separator
Calculation Method   : AP42
Control Efficiency    : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group     : C10+

Filed Name          : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi Separator
Well Name            : Harpoon Battery Tanks OT-1 through OT-4
Date                : 8/30/2018

*****
* Data Input *
*****
Separator Pressure (psia)      : 55.00
Separator Temperature (F)       : 112.0
C10+ SG                         : 0.83
C10+ MW(lb/lbmol)              : 244.20

-- Low Pressure Oil -----
No. Component        Mole%   Wt%
1    H2S             0.0000  0.0000
2    O2              0.0000  0.0000
3    CO2             0.0080  0.0021
4    N2              0.0180  0.0030
5    C1              1.5020  0.1435
6    C2              1.2090  0.2165
7    C3              1.9110  0.5018
8    i-C4             0.5960  0.2063
9    n-C4             2.3410  0.8101
10   i-C5             1.4700  0.6315
11   n-C5             2.5010  1.0744
12   C6              2.2640  1.1615
13   C7              10.2539 6.1177
14   C8              13.6989 9.3174
15   C9              7.5709  5.7828
16   C10+            48.5504 70.5942
17   Benzene          0.2050  0.0953
18   Toluene          1.0260  0.5628
19   E-Benzene        0.2820  0.1783
20   Xylenes          2.0500  1.2959
21   n-C6             2.5430  1.3049
22   224Trimethylp    0.0000  0.0000

-- Sales Oil -----
Production Rate (bbl/day)   : 89.00
Days of Annual Operation   : 365
API Gravity                 : 49.00
Reid Vapor Pressure (psia) : 6.38
Bulk Temperature             : 75.0

-- Tank and Shell Data -----
Diameter (ft)               : 21.00
Shell Height (ft)            : 16.00
Cone Roof Slope              : 0.06
Average Liquid Height (ft)   : 10.00
Vent Pressure Range (psia)  : 0.50
Solar Absorbance              : 0.54

-- Meteorological Data -----
```

City : Midland/Odessa, TX
 Min Ambient Temperature (F) : 49.9
 Max Ambient Temperature (F) : 77.0
 Total Solar Insolation (F) : 1802.00
 Ambient Pressure (psia) : 14.73
 Ambient Temperature (F) : 80.0

 * Calculation Results *

-- Emission Summary -----

	Uncontrolled	Controlled
	ton	ton
Total HAPs	0.5270	0.0105
Total HC	23.1640	0.4633
VOCs, C2+	17.8250	0.3565
VOCs, C3+	12.6890	0.2538
CO2	0.0670	
CH4	5.3390	

Uncontrolled Recovery Information:

Vapor(mscfd) : 1.5400
 HC Vapor(mscfd) : 1.5200
 CO2(mscfd) : 0.0000
 CH4(mscfd) : 0.6900
 GOR(SCF/STB) : 17.3034

-- Emission Composition -----

NoComponent	Uncontrolled	Controlled
	ton	ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.0670	0.0670
4 N2	0.1280	0.1280
5 C1	5.3390	0.1068
6 C2	5.1370	0.1027
7 C3	5.2670	0.1053
8 i-C4	1.0060	0.0201
9 n-C4	2.7920	0.0558
10 i-C5	0.8860	0.0177
11 n-C5	1.1330	0.0227
12 C6	0.3720	0.0074
13 Benzene	0.0260	0.0005
14 Toluene	0.0440	0.0009
15 E-Benzene	0.0050	0.0001
16 Xylenes	0.0290	0.0006
17 n-C6	0.4230	0.0085
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	0.6810	0.0136
20 Pseudo Comp2	0.0230	0.0005
21 Pseudo Comp3	0.0000	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	23.3580	0.4672

-- Stream Data -----

NoComponent	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
	lb/lbmol	mole %	mole %	mole %	mole %	mole %	mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0080	0.0027	0.0005	0.2176	0.1201	0.2070
4 N2	28.01	0.0180	0.0009	0.0000	0.6927	0.0003	0.6175
5 C1	16.04	1.5020	0.2659	0.0010	50.3998	0.7543	45.0057
6 C2	30.07	1.2090	0.6858	0.3505	21.9055	32.8874	23.0987
7 C3	44.10	1.9110	1.6031	1.3467	14.0910	33.0450	16.1504

8 i-C4	58.12	0.5960	0.5605	0.5261	2.0002	5.1420	2.3416
9 n-C4	58.12	2.3410	2.2605	2.1729	5.5262	14.4401	6.4947
10 i-C5	72.15	1.4700	1.4716	1.4595	1.4074	3.7376	1.6606
11 n-C5	72.15	2.5010	2.5187	2.5106	1.8002	4.7817	2.1242
12 C6	84.00	2.2640	2.3084	2.3246	0.5085	1.3409	0.5990
13 Benzene	78.11	0.2050	0.2092	0.2108	0.0387	0.1024	0.0456
14 Toluene	92.14	1.0260	1.0505	1.0615	0.0551	0.1435	0.0647
15 E-Benzene	106.17	0.2820	0.2890	0.2922	0.0051	0.0131	0.0060
16 Xylenes	106.17	2.0500	2.1010	2.1246	0.0319	0.0816	0.0373
17 n-C6	86.18	2.5430	2.5930	2.6114	0.5634	1.4855	0.6636
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Comp1	106.78	31.5237	32.3020	32.6586	0.7385	1.8807	0.8626
20 Pseudo Comp2	152.19	18.6156	19.0858	19.3047	0.0179	0.0434	0.0206
21 Pseudo Comp3	217.52	13.5813	13.9246	14.0846	0.0002	0.0004	0.0002
22 Pseudo Comp4	302.28	10.1407	10.3970	10.5165	0.0000	0.0000	0.0000
23 Pseudo Comp5	481.86	6.2127	6.3697	6.4429	0.0000	0.0000	0.0000
MW (lb/lbmol):		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
		165.83	169.27	170.39	29.71	46.96	31.59
Stream Mole Ratio:		1.0000	0.9753	0.9723	0.0247	0.0030	0.0277
Stream Weight Ratio:		165.83	165.09	165.67	0.73	0.14	0.87
Total Emission (ton):					19.586	3.773	23.359
Heating Value (BTU/scf):					1724.62	2657.01	1825.93
Gas Gravity (Gas/Air):					1.03	1.62	1.09
Bubble Pt. @100F (psia):	60.83	17.41	6.85				
RVP @100F (psia):	96.08	49.21	34.06				
Spec. Gravity @100F:	0.77	0.77	0.77				

```
*****
* Project Setup Information *
*****
Project File      : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\0000 Determinations\HarrisonRY18.
Flowsheet Selection : Oil Tank with Separator
Calculation Method   : AP42
Control Efficiency    : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group       : C10+

Filed Name          : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi Separator
Well Name            : Harrison Battery Tanks OT-1 through OT-3
Date                : 8/30/2018

*****
* Data Input *
*****
Separator Pressure (psia)      : 55.00
Separator Temperature (F)        : 112.0
C10+ SG                         : 0.83
C10+ MW(lb/lbmol)               : 244.20

-- Low Pressure Oil -----
No. Component      Mole%   Wt%
1   H2S             0.0000  0.0000
2   O2              0.0000  0.0000
3   CO2             0.0080  0.0021
4   N2              0.0180  0.0030
5   C1              1.5020  0.1435
6   C2              1.2090  0.2165
7   C3              1.9110  0.5018
8   i-C4             0.5960  0.2063
9   n-C4             2.3410  0.8101
10  i-C5             1.4700  0.6315
11  n-C5             2.5010  1.0744
12  C6              2.2640  1.1615
13  C7              10.2539 6.1177
14  C8              13.6989 9.3174
15  C9              7.5709  5.7828
16  C10+            48.5504 70.5942
17  Benzene          0.2050  0.0953
18  Toluene          1.0260  0.5628
19  E-Benzene        0.2820  0.1783
20  Xylenes          2.0500  1.2959
21  n-C6             2.5430  1.3049
22  224Trimethylp    0.0000  0.0000

-- Sales Oil -----
Production Rate (bbl/day) : 245.00
Days of Annual Operation : 365
API Gravity              : 48.00
Reid Vapor Pressure (psia) : 6.38
Bulk Temperature          : 70.0

-- Tank and Shell Data -----
Diameter (ft)           : 21.00
Shell Height (ft)         : 16.00
Cone Roof Slope          : 0.06
Average Liquid Height (ft) : 10.00
Vent Pressure Range (psia) : 0.50
Solar Absorbance          : 0.54

-- Meteorological Data -----
```

City : Midland/Odessa, TX
 Min Ambient Temperature (F) : 49.9
 Max Ambient Temperature (F) : 77.0
 Total Solar Insolation (F) : 1802.00
 Ambient Pressure (psia) : 14.73
 Ambient Temperature (F) : 80.0

 * Calculation Results *

-- Emission Summary -----

	Uncontrolled	Controlled
	ton	ton
Total HAPs	1.2080	0.0242
Total HC	58.3360	1.1667
VOCs, C2+	42.7120	0.8542
VOCs, C3+	29.5450	0.5909
CO2	0.1890	
CH4	15.6240	

Uncontrolled Recovery Information:

Vapor (mscfd) : 4.0800
 HC Vapor (mscfd) : 4.0500
 CO2 (mscfd) : 0.0100
 CH4 (mscfd) : 2.0200
 GOR (SCF/STB) : 16.6531

-- Emission Composition -----

NoComponent	Uncontrolled	Controlled
	ton	ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.1890	0.1890
4 N2	0.3570	0.3570
5 C1	15.6240	0.3125
6 C2	13.1670	0.2633
7 C3	12.4690	0.2494
8 i-C4	2.3320	0.0466
9 n-C4	6.4380	0.1288
10 i-C5	2.0320	0.0406
11 n-C5	2.5970	0.0519
12 C6	0.8520	0.0170
13 Benzene	0.0600	0.0012
14 Toluene	0.1010	0.0020
15 E-Benzene	0.0110	0.0002
16 Xylenes	0.0670	0.0013
17 n-C6	0.9680	0.0194
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	1.5630	0.0313
20 Pseudo Comp2	0.0540	0.0011
21 Pseudo Comp3	0.0010	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	58.8820	1.1776

-- Stream Data -----

NoComponent	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
	lb/lbmol	mole %	mole %	mole %	mole %	mole %	mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0080	0.0027	0.0018	0.2176	0.2342	0.2187
4 N2	28.01	0.0180	0.0009	0.0000	0.6927	0.0172	0.6481
5 C1	16.04	1.5020	0.2659	0.1026	50.3998	37.5592	49.5520
6 C2	30.07	1.2090	0.6858	0.5923	21.9055	27.4988	22.2748
7 C3	44.10	1.9110	1.6031	1.5462	14.0910	18.5265	14.3839

8 i-C4	58.12	0.5960	0.5605	0.5538	2.0002	2.6164	2.0409
9 n-C4	58.12	2.3410	2.2605	2.2449	5.5262	7.1701	5.6347
10 i-C5	72.15	1.4700	1.4716	1.4711	1.4074	1.7904	1.4327
11 n-C5	72.15	2.5010	2.5187	2.5206	1.8002	2.2701	1.8312
12 C6	84.00	2.2640	2.3084	2.3150	0.5085	0.6216	0.5160
13 Benzene	78.11	0.2050	0.2092	0.2098	0.0387	0.0474	0.0393
14 Toluene	92.14	1.0260	1.0505	1.0543	0.0551	0.0652	0.0558
15 E-Benzene	106.17	0.2820	0.2890	0.2901	0.0051	0.0058	0.0051
16 Xylenes	106.17	2.0500	2.1010	2.1089	0.0319	0.0364	0.0322
17 n-C6	86.18	2.5430	2.5930	2.6006	0.5634	0.6882	0.5717
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Comp1	106.78	31.5237	32.3020	32.4218	0.7385	0.8340	0.7448
20 Pseudo Comp2	152.19	18.6156	19.0858	19.1582	0.0179	0.0184	0.0179
21 Pseudo Comp3	217.52	13.5813	13.9246	13.9775	0.0002	0.0002	0.0002
22 Pseudo Comp4	302.28	10.1407	10.3970	10.4365	0.0000	0.0000	0.0000
23 Pseudo Comp5	481.86	6.2127	6.3697	6.3939	0.0000	0.0000	0.0000
MW (lb/lbmol) :		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
	165.83	169.27	169.55	29.71	33.37	29.95	
Stream Mole Ratio:	1.0000	0.9753	0.9736	0.0247	0.0017	0.0264	
Stream Weight Ratio:	165.83	165.09	165.07	0.73	0.06	0.79	
Total Emission (ton) :				54.552	4.331	58.882	
Heating Value (BTU/scf) :				1724.62	1930.67	1738.23	
Gas Gravity (Gas/Air) :				1.03	1.15	1.03	
Bubble Pt. @100F (psia) :	60.83	17.41	11.70				
RVP @100F (psia) :	96.08	49.21	42.75				
Spec. Gravity @100F:	0.77	0.77	0.77				

```
*****
* Project Setup Information *
*****
Project File : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\0000 Determinations\RenegadeRY18
Flowsheet Selection : Oil Tank with Separator
Calculation Method : AP42
Control Efficiency : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi Separator
Well Name : Renegade Battery Tanks OT-1 through OT-3
Date : 8/30/2018

*****
* Data Input *
*****
Separator Pressure (psia) : 55.00
Separator Temperature (F) : 112.0
C10+ SG : 0.83
C10+ MW(lb/lbmol) : 244.20

-- Low Pressure Oil -----
No. Component Mole% Wt%
1 H2S 0.0000 0.0000
2 O2 0.0000 0.0000
3 CO2 0.0080 0.0021
4 N2 0.0180 0.0030
5 C1 1.5020 0.1435
6 C2 1.2090 0.2165
7 C3 1.9110 0.5018
8 i-C4 0.5960 0.2063
9 n-C4 2.3410 0.8101
10 i-C5 1.4700 0.6315
11 n-C5 2.5010 1.0744
12 C6 2.2640 1.1615
13 C7 10.2539 6.1177
14 C8 13.6989 9.3174
15 C9 7.5709 5.7828
16 C10+ 48.5504 70.5942
17 Benzene 0.2050 0.0953
18 Toluene 1.0260 0.5628
19 E-Benzene 0.2820 0.1783
20 Xlenes 2.0500 1.2959
21 n-C6 2.5430 1.3049
22 224Trimethylp 0.0000 0.0000

-- Sales Oil -----
Production Rate (bbl/day) : 282.00
Days of Annual Operation : 365
API Gravity : 48.00
Reid Vapor Pressure (psia) : 6.38
Bulk Temperature : 70.0

-- Tank and Shell Data -----
Diameter (ft) : 21.00
Shell Height (ft) : 16.00
Cone Roof Slope : 0.06
Average Liquid Height (ft) : 10.00
Vent Pressure Range (psia) : 0.50
Solar Absorbance : 0.54

-- Meteorological Data -----
```

City : Midland/Odessa, TX
 Min Ambient Temperature (F) : 49.9
 Max Ambient Temperature (F) : 77.0
 Total Solar Insolation (F) : 1802.00
 Ambient Pressure (psia) : 14.73
 Ambient Temperature (F) : 80.0

 * Calculation Results *

-- Emission Summary -----

	Uncontrolled ton	Controlled ton
Total HAPs	1.3780	0.0276
Total HC	66.6490	1.3330
VOCs, C2+	48.7160	0.9743
VOCs, C3+	33.6910	0.6738
CO2	0.2160	
CH4	17.9330	

Uncontrolled Recovery Information:

Vapor(mscfd) : 4.6700
 HC Vapor(mscfd) : 4.6300
 CO2(mscfd) : 0.0100
 CH4(mscfd) : 2.3200
 GOR(SCF/STB) : 16.5603

-- Emission Composition -----

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.2160	0.2160
4 N2	0.4130	0.4130
5 C1	17.9330	0.3587
6 C2	15.0250	0.3005
7 C3	14.2170	0.2843
8 i-C4	2.6580	0.0532
9 n-C4	7.3400	0.1468
10 i-C5	2.3170	0.0463
11 n-C5	2.9620	0.0592
12 C6	0.9720	0.0194
13 Benzene	0.0690	0.0014
14 Toluene	0.1150	0.0023
15 E-Benzene	0.0120	0.0002
16 Xylenes	0.0770	0.0015
17 n-C6	1.1050	0.0221
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	1.7840	0.0357
20 Pseudo Comp2	0.0610	0.0012
21 Pseudo Comp3	0.0010	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	67.2770	1.3455

-- Stream Data -----

NoComponent	MW lb/lbmol	LP Oil mole %	Flash Oil mole %	Sales Oil mole %	Flash Gas mole %	W&S Gas mole %	Total Emission mole %
1 H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2 O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3 CO2	44.01	0.0080	0.0027	0.0019	0.2176	0.2332	0.2186
4 N2	28.01	0.0180	0.0009	0.0000	0.6927	0.0669	0.6548
5 C1	16.04	1.5020	0.2659	0.1160	50.3998	38.9009	49.7037
6 C2	30.07	1.2090	0.6858	0.6020	21.9055	26.9893	22.2133
7 C3	44.10	1.9110	1.6031	1.5523	14.0910	18.0698	14.3319

8 i-C4	58.12	0.5960	0.5605	0.5545	2.0002	2.5486	2.0334
9 n-C4	58.12	2.3410	2.2605	2.2466	5.5262	6.9825	5.6143
10 i-C5	72.15	1.4700	1.4716	1.4713	1.4074	1.7430	1.4277
11 n-C5	72.15	2.5010	2.5187	2.5205	1.8002	2.2099	1.8250
12 C6	84.00	2.2640	2.3084	2.3144	0.5085	0.6052	0.5144
13 Benzene	78.11	0.2050	0.2092	0.2098	0.0387	0.0461	0.0392
14 Toluene	92.14	1.0260	1.0505	1.0540	0.0551	0.0635	0.0556
15 E-Benzene	106.17	0.2820	0.2890	0.2900	0.0051	0.0057	0.0051
16 Xylenes	106.17	2.0500	2.1010	2.1081	0.0319	0.0354	0.0321
17 n-C6	86.18	2.5430	2.5930	2.5999	0.5634	0.6699	0.5699
18 224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19 Pseudo Comp1	106.78	31.5237	32.3020	32.4104	0.7385	0.8120	0.7429
20 Pseudo Comp2	152.19	18.6156	19.0858	19.1513	0.0179	0.0179	0.0179
21 Pseudo Comp3	217.52	13.5813	13.9246	13.9725	0.0002	0.0002	0.0002
22 Pseudo Comp4	302.28	10.1407	10.3970	10.4328	0.0000	0.0000	0.0000
23 Pseudo Comp5	481.86	6.2127	6.3697	6.3916	0.0000	0.0000	0.0000
MW (lb/lbmol) :		LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S Gas	Total Emission
Stream Mole Ratio:		165.83	169.27	169.52	29.71	32.96	29.91
Stream Weight Ratio:		1.0000	0.9753	0.9738	0.0247	0.0016	0.0262
Total Emission (ton) :		165.83	165.09	165.07	0.73	0.05	0.78
Heating Value (BTU/scf) :					62.790	4.488	67.278
Gas Gravity (Gas/Air) :					1724.62	1908.01	1735.73
Bubble Pt. @100F (psia) :	60.83	17.41	12.18		1.03	1.14	1.03
RVP @100F (psia) :	96.08	49.21	43.51				
Spec. Gravity @100F:	0.77	0.77	0.77				

RenegadeTB_RY2018.txt

```
*****
*      Project Setup Information
*
*****
Project File          : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\eft
files\2018_PHANTOM-55PSI_REPO.ept3
Flowsheet Selection    : Oil Tank with Separator
Calculation Method     : AP42
Control Efficiency      : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition: No
Component Group         : C10+

Filed Name             : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi
Separator
Well Name              : Renegade Battery
Date                  : 2018.03.05

*****
*      Data Input
*
*****
Separator Pressure (psia)   : 55.00
Separator Temperature (F)    : 112.0
C10+ SG                   : 0.83
C10+ MW(lb/lbmol)          : 244.20

-- Low Pressure Oil
-----
No. Component           Mole%   Wt%
1  H2S                  0.0000  0.0000
2  O2                   0.0000  0.0000
3  CO2                  0.0080  0.0021
4  N2                   0.0180  0.0030
5  C1                   1.5020  0.1435
6  C2                   1.2090  0.2165
7  C3                   1.9110  0.5018
8  i-C4                 0.5960  0.2063
9  n-C4                 2.3410  0.8101
10 i-C5                 1.4700  0.6315
11 n-C5                 2.5010  1.0744
```

RenegadeTB_RY2018.txt

12	C6	2.2640	1.1615
13	C7	10.2539	6.1177
14	C8	13.6989	9.3174
15	C9	7.5709	5.7828
16	C10+	48.5504	70.5942
17	Benzene	0.2050	0.0953
18	Toluene	1.0260	0.5628
19	E-Benzene	0.2820	0.1783
20	Xylenes	2.0500	1.2959
21	n-C6	2.5430	1.3049
22	224Trimethylp	0.0000	0.0000

-- Sales Oil

Production Rate (bbl/day)	:	203.00
Days of Annual Operation	:	365
API Gravity	:	49.00
Reid Vapor Pressure (psia)	:	6.38
Bulk Temperature	:	80.0

-- Tank and Shell Data

Diameter (ft)	:	21.00
Shell Height (ft)	:	16.00
Cone Roof Slope	:	0.06
Average Liquid Height (ft)	:	10.00
Vent Pressure Range (psia)	:	0.50
Solar Absorbance	:	0.54

-- Meteorological Data

Page 1----- E&P TANK

City	:	Midland/Odessa, TX
Min Ambient Temperature (F)	:	49.9
Max Ambient Temperature (F)	:	77.0
Total Solar Insolation (F)	:	1802.00
Ambient Pressure (psia)	:	14.73
Ambient Temperature (F)	:	80.0

* Calculation Results
*

RenegadeTB_RY2018.txt

-- Emission Summary

	Uncontrolled ton	Controlled ton
Total HAPs	1.0380	0.0208
Total HC	49.1600	0.9832
VOCs, C2+	36.2890	0.7258
VOCs, C3+	25.1970	0.5039
CO2	0.1580	
CH4	12.8720	

Uncontrolled Recovery Information:

Vapor(mscfd): 3.4100
HC Vapor(mscfd): 3.3800
CO2(mscfd): 0.0100
CH4(mscfd): 1.6700
GOR(SCF/STB): 16.7980

-- Emission Composition

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.1580	0.1580
4 N2	0.2920	0.2920
5 C1	12.8720	0.2574
6 C2	11.0920	0.2218
7 C3	10.5870	0.2117
8 i-C4	1.9860	0.0397
9 n-C4	5.4920	0.1098
10 i-C5	1.7380	0.0348
11 n-C5	2.2240	0.0445
12 C6	0.7320	0.0146
13 Benzene	0.0520	0.0010
14 Toluene	0.0870	0.0017
15 E-Benzene	0.0090	0.0002
16 Xylenes	0.0580	0.0012
17 n-C6	0.8320	0.0166
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	1.3520	0.0270
20 Pseudo Comp2	0.0470	0.0009
21 Pseudo Comp3	0.0010	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	49.6110	0.9922

RenegadeTB_RY2018.txt

-- Stream Data

No	Component	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S
Gas	Total Emission	lb/lbmol	mole %	mole %	mole %	mole %	mole
%	mole %						
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000		0.0000					
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000		0.0000					
3	CO2	44.01	0.0080	0.0027	0.0016	0.2176	
0.2277		0.2185					
4	N2	28.01	0.0180	0.0009	0.0000	0.6927	
0.0005		0.6348					
5	C1	16.04	1.5020	0.2659	0.0728	50.3998	
31.9243		48.8543					
6	C2	30.07	1.2090	0.6858	0.5617	21.9055	
28.4844		22.4558					
7	C3	44.10	1.9110	1.6031	1.5231	14.0910	
20.3627		14.6156					
Page	2						E&P TANK
8	i-C4	58.12	0.5960	0.5605	0.5506	2.0002	
2.9632		2.0808					
9	n-C4	58.12	2.3410	2.2605	2.2364	5.5262	
8.2366		5.7529					
10	i-C5	72.15	1.4700	1.4716	1.4698	1.4074	
2.1150		1.4666					
11	n-C5	72.15	2.5010	2.5187	2.5196	1.8002	
2.7110		1.8764					
12	C6	84.00	2.2640	2.3084	2.3165	0.5085	
0.7694		0.5304					
13	Benzene	78.11	0.2050	0.2092	0.2100	0.0387	
0.0587		0.0404					
14	Toluene	92.14	1.0260	1.0505	1.0554	0.0551	
0.0838		0.0575					
15	E-Benzene	106.17	0.2820	0.2890	0.2904	0.0051	
0.0077		0.0053					
16	Xylenes	106.17	2.0500	2.1010	2.1112	0.0319	
0.0486		0.0333					
17	n-C6	86.18	2.5430	2.5930	2.6022	0.5634	
0.8524		0.5876					
18	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	
0.0000		0.0000					
19	Pseudo Comp1	106.78	31.5237	32.3020	32.4564	0.7385	
1.1264		0.7709					
20	Pseudo Comp2	152.19	18.6156	19.0858	19.1797	0.0179	
0.0274		0.0187					

RenegadeTB_RY2018.txt					
21 Pseudo Comp3	217.52	13.5813	13.9246	13.9932	0.0002
0.0003	0.0002				
22 Pseudo Comp4	302.28	10.1407	10.3970	10.4483	0.0000
0.0000	0.0000				
23 Pseudo Comp5	481.86	6.2127	6.3697	6.4012	0.0000
0.0000	0.0000				
Gas Total Emission		LP Oil	Flash Oil	Sales Oil	Flash Gas
MW (lb/lbmol):		165.83	169.27	169.63	29.71
30.20					35.57
Stream Mole Ratio:		1.0000	0.9753	0.9731	0.0247
0.0023	0.0269				
Stream Weight Ratio:		165.83	165.09	165.06	0.73
0.81					0.08
Total Emission (ton):					44.723
49.610					4.887
Heating Value (BTU/scf):					1724.62
2048.04	1751.68				
Gas Gravity (Gas/Air):				1.03	1.23
1.04					
Bubble Pt. @100F (psia):	60.83	17.41	10.58		
RVP @100F (psia):	96.08	49.21	41.86		
Spec. Gravity @100F:	0.77	0.77	0.77		

SteamworksTB_RY2018.txt

* Project Setup Information
*

Project File : C:\Users\DMallory\Desktop\Air\0000a Reporting\Tanks\eft
files\2018_PHANTOM-55PSI_REPO.ept3
Flowsheet Selection : Oil Tank with Separator
Calculation Method : AP42
Control Efficiency : 98.00%
Known Separator Stream : Low Pressure Oil
Entering Air Composition : No
Component Group : C10+

Filed Name : Phanotm (Wolfcamp) Horizontal Tank Battery 55 psi
Separator
Well Name : Renegade Battery
Date : 2018.03.05

* Data Input
*

Separator Pressure (psia) : 55.00
Separator Temperature (F) : 112.0
C10+ SG : 0.83
C10+ MW(lb/lbmol) : 244.20

-- Low Pressure Oil

No.	Component	Mole%	Wt%
1	H2S	0.0000	0.0000
2	O2	0.0000	0.0000
3	CO2	0.0080	0.0021
4	N2	0.0180	0.0030
5	C1	1.5020	0.1435
6	C2	1.2090	0.2165
7	C3	1.9110	0.5018
8	i-C4	0.5960	0.2063
9	n-C4	2.3410	0.8101
10	i-C5	1.4700	0.6315
11	n-C5	2.5010	1.0744

SteamworksTB_RY2018.txt

12	C6	2.2640	1.1615
13	C7	10.2539	6.1177
14	C8	13.6989	9.3174
15	C9	7.5709	5.7828
16	C10+	48.5504	70.5942
17	Benzene	0.2050	0.0953
18	Toluene	1.0260	0.5628
19	E-Benzene	0.2820	0.1783
20	Xylenes	2.0500	1.2959
21	n-C6	2.5430	1.3049
22	224Trimethylp	0.0000	0.0000

-- Sales Oil

Production Rate (bbl/day) : 127.00
Days of Annual Operation : 365
API Gravity : 49.00
Reid Vapor Pressure (psia) : 6.38
Bulk Temperature : 80.0

-- Tank and Shell Data

Diameter (ft) : 21.00
Shell Height (ft) : 16.00
Cone Roof Slope : 0.06
Average Liquid Height (ft) : 10.00
Vent Pressure Range (psia) : 0.50
Solar Absorbance : 0.54

-- Meteorological Data

Page 1----- E&P TANK

City : Midland/Odessa, TX
Min Ambient Temperature (F) : 49.9
Max Ambient Temperature (F) : 77.0
Total Solar Insolation (F) : 1802.00
Ambient Pressure (psia) : 14.73
Ambient Temperature (F) : 80.0

* Calculation Results
*

SteamworksTB_RY2018.txt

-- Emission Summary

	Uncontrolled ton	Controlled ton
Total HAPs	0.6970	0.0139
Total HC	32.1800	0.6436
VOCs, C2+	24.1710	0.4834
VOCs, C3+	16.8620	0.3372
CO2	0.1020	
CH4	8.0090	

Uncontrolled Recovery Information:

Vapor(mscfd): 2.2000
HC Vapor(mscfd): 2.1800
CO2(mscfd): 0.0000
CH4(mscfd): 1.0400
GOR(SCF/STB): 17.3228

-- Emission Composition

NoComponent	Uncontrolled ton	Controlled ton
1 H2S	0.0000	0.0000
2 O2	0.0000	0.0000
3 CO2	0.1020	0.1020
4 N2	0.1830	0.1830
5 C1	8.0090	0.1602
6 C2	7.3090	0.1462
7 C3	7.0670	0.1413
8 i-C4	1.3300	0.0266
9 n-C4	3.6800	0.0736
10 i-C5	1.1660	0.0233
11 n-C5	1.4920	0.0298
12 C6	0.4910	0.0098
13 Benzene	0.0350	0.0007
14 Toluene	0.0580	0.0012
15 E-Benzene	0.0060	0.0001
16 Xylenes	0.0390	0.0008
17 n-C6	0.5580	0.0112
18 224Trimethylp	0.0000	0.0000
19 Pseudo Comp1	0.9080	0.0182
20 Pseudo Comp2	0.0310	0.0006
21 Pseudo Comp3	0.0000	0.0000
22 Pseudo Comp4	0.0000	0.0000
23 Pseudo Comp5	0.0000	0.0000
24 Total	32.4640	0.6493

SteamworksTB_RY2018.txt

-- Stream Data

No	Component	MW	LP Oil	Flash Oil	Sales Oil	Flash Gas	W&S
Gas	Total Emission	lb/lbmol	mole %	mole %	mole %	mole %	mole
%	mole %						
1	H2S	34.80	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000						
2	O2	32.00	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000						
3	CO2	44.01	0.0080	0.0027	0.0012	0.2176	
0.2277	0.2187						
4	N2	28.01	0.0180	0.0009	0.0000	0.6927	
0.0005	0.6170						
5	C1	16.04	1.5020	0.2659	0.0224	50.3998	
21.4673	47.2364						
6	C2	30.07	1.2090	0.6858	0.5001	21.9055	
31.8749	22.9955						
7	C3	44.10	1.9110	1.6031	1.4796	14.0910	
23.8713	15.1604						
Page	2						E&P TANK
8	i-C4	58.12	0.5960	0.5605	0.5449	2.0002	
3.5080	2.1651						
9	n-C4	58.12	2.3410	2.2605	2.2219	5.5262	
9.7708	5.9903						
10	i-C5	72.15	1.4700	1.4716	1.4679	1.4074	
2.5150	1.5285						
11	n-C5	72.15	2.5010	2.5187	2.5184	1.8002	
3.2250	1.9560						
12	C6	84.00	2.2640	2.3084	2.3194	0.5085	
0.9156	0.5530						
13	Benzene	78.11	0.2050	0.2092	0.2103	0.0387	
0.0698	0.0421						
14	Toluene	92.14	1.0260	1.0505	1.0573	0.0551	
0.0997	0.0600						
15	E-Benzene	106.17	0.2820	0.2890	0.2910	0.0051	
0.0092	0.0055						
16	Xylenes	106.17	2.0500	2.1010	2.1154	0.0319	
0.0578	0.0347						
17	n-C6	86.18	2.5430	2.5930	2.6055	0.5634	
1.0145	0.6128						
18	224Trimethylp	114.24	0.0000	0.0000	0.0000	0.0000	
0.0000	0.0000						
19	Pseudo Comp1	106.78	31.5237	32.3020	32.5202	0.7385	
1.3399	0.8042						
20	Pseudo Comp2	152.19	18.6156	19.0858	19.2189	0.0179	
0.0326	0.0195						

		SteamworksTB_RY2018.txt				
21 Pseudo	Comp3	217.52	13.5813	13.9246	14.0219	0.0002
0.0003		0.0002				
22 Pseudo	Comp4	302.28	10.1407	10.3970	10.4696	0.0000
0.0000		0.0000				
23 Pseudo	Comp5	481.86	6.2127	6.3697	6.4143	0.0000
0.0000		0.0000				
Gas	Total Emission		LP Oil	Flash Oil	Sales Oil	Flash Gas
MW (lb/lbmol):		165.83	169.27	169.80	29.71	38.86
30.71						
Stream Mole Ratio:		1.0000	0.9753	0.9723	0.0247	
0.0030	0.0277					
Stream Weight Ratio:		165.83	165.09	165.10	0.73	0.12
0.85						
Total Emission (ton):					27.974	4.491
32.465						
Heating Value (BTU/scf):					1724.62	
2223.53	1779.17					
Gas Gravity (Gas/Air):					1.03	1.34
1.06						
Bubble Pt. @100F (psia):		60.83	17.41	8.62		
RVP @100F (psia):		96.08	49.21	38.91		
Spec. Gravity @100F:		0.77	0.77	0.77		

NORTH ELEPHANT WT-1

Water Production	5,328 bbls/day
Sample Pressure	60 psig
Sample Temperature	140 °F
Gas/Water Ratio	0.42 scf/bbl
	2,238 scf/day
Vapor	2.23776 mscfd
	817 mscf/year
VOC/unit gas volume	18.66 lbs/mscf
VOC	7.6 TPY
W&B VOC from EPA Tanks	0.4 TPY
TOTAL VOC	8.1 TPY

Produced water flashing emissions were estimated using a representative laboratory flash analysis of produced water. Copies of the flash analysis are enclosed.

Working and breathing losses for produced water tanks were estimated using EPA Tanks, version 4.09d with the pre-loaded Crude Oil RVP 5 parameters. Working and breathing losses for produced water were assumed to be 1% of those represented for Crude Oil RVP 5. A text file showing results of the EPA Tanks analysis are enclosed.

NElephantWT_W&S.txt
TANKS 4.0 Report <!-- function StartUp() { var DataSource=new ActiveXObject("microsoft.xmlDOM"); DataSource.load("summarydata.xml"); var XslStyle=new ActiveXObject("microsoft.xmlDOM"); XslStyle.load("summary.xsl");

document.all.item("xslcontainer").innerHTML=DataSource.transformNode(XslStyle.documentElement);
} //-->
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: Phantom WC Prod Water
City: Midland-Odessa
State: Texas
Company: Resolute
Type of Tank: Vertical Fixed Roof Tank
Description: W&S losses from produced water storage tanks.

Tank Dimensions

Shell Height (ft): 16.00
Diameter (ft): 21.50
Liquid Height (ft) : 14.00
Avg. Liquid Height (ft): 8.00
Volume (gallons): 38,021.39
Turnovers: 3,968.24
Net Throughput(gal/yr): 150,877,860.00
Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: Gray/Light
Shell Condition: Good
Roof Color/Shade: Gray/Light
Roof Condition: Good

Roof Characteristics

Type: Cone

NElephantWT_W&S.txt

Height (ft)1.00
Slope (ft/ft) (Cone Roof)0.09

Breather Vent Settings
Vacuum Settings (psig):-0.03
Pressure Settings (psig)0.03

Meteorological Data used in Emissions Calculations: Midland-Odessa, Texas
(Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Daily Liquid Surf.
Temperature (deg F)Liquid
Bulk
Temp Vapor Pressure (psia)Vapor
Mol. Liquid
Mass Vapor
Mass Mol. Basis for Vapor Pressure
Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.
Fract. Weight Calculations

Crude oil (RVP 5)All171.7460.3383.1565.52 3.60542.89644.446950.0000
207.00 Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

NElephantWT_W&S.txt
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Annual Emission Calculations

Standing Losses (lb):3,230.5360
Vapor Space Volume (cu ft):3,025.4192
Vapor Density (lb/cu ft):0.0316
Vapor Space Expansion Factor:0.2399
Vented Vapor Saturation Factor:0.3857

Tank Vapor Space Volume:

Vapor Space Volume (cu ft):3,025.4192
Tank Diameter (ft):21.5000
Vapor Space Outage (ft):8.3333
Tank Shell Height (ft):16.0000
Average Liquid Height (ft):8.0000
Roof Outage (ft):0.3333

Roof Outage (Cone Roof)

Roof Outage (ft):0.3333
Roof Height (ft):1.0000
Roof Slope (ft/ft):0.0900
Shell Radius (ft):10.7500

Vapor Density

Vapor Density (lb/cu ft):0.0316
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia):3.6054
Daily Avg. Liquid Surface Temp. (deg. R):531.4068
Daily Average Ambient Temp. (deg. F):63.2750
Ideal Gas Constant R
(psia cuft / (lb-mol-deg R)):10.731
Liquid Bulk Temperature (deg. R):525.1850
Tank Paint Solar Absorptance (Shell):0.5400
Tank Paint Solar Absorptance (Roof):0.5400
Daily Total Solar Insulation
Factor (Btu/sqft day):1,689.4892

Vapor Space Expansion Factor

Vapor Space Expansion Factor:0.2399

NElephantWT_W&S.txt

Daily Vapor Temperature Range (deg. R):45.6331
Daily Vapor Pressure Range (psia):1.5505
Breather Vent Press. Setting Range(psia):0.0600
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Vapor Pressure at Daily Minimum Liquid
 Surface Temperature (psia):2.8964
Vapor Pressure at Daily Maximum Liquid
 Surface Temperature (psia):4.4469
Daily Avg. Liquid Surface Temp. (deg R):531.4068
Daily Min. Liquid Surface Temp. (deg R):519.9985
Daily Max. Liquid Surface Temp. (deg R):542.8150
Daily Ambient Temp. Range (deg. R):27.9000

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor:0.3857
Vapor Pressure at Daily Average Liquid:
 Surface Temperature (psia):3.6054
Vapor Space Outage (ft):8.3333

Working Losses (lb):84,621.1991

Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Annual Net Throughput (gal/yr.):150,877,860.0000
Annual Turnovers:3,968.2359
Turnover Factor:0.1742
Maximum Liquid Volume (gal):38,021.3938
Maximum Liquid Height (ft):14.0000
Tank Diameter (ft):21.5000
Working Loss Product Factor:0.7500

Total Losses (lb):87,851.7351

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

NElephantWT_W&S.txt

Components	Losses(lbs)	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	84,621.203,230.54	87,851.74		

SOUTH ELEPHANT WT-1

Water Production	10,275 bbls/day
Sample Pressure	60 psig
Sample Temperature	140 °F
Gas/Water Ratio	0.42 scf/bbl
	4,316 scf/day
Vapor	4.3155 mscfd
	1,575 mscf/year
VOC/unit gas volume	18.66 lbs/mscf
VOC	14.7 TPY
W&B VOC from EPA Tanks	0.9 TPY
TOTAL VOC	15.6 TPY

Produced water flashing emissions were estimated using a representative laboratory flash analysis of produced water. Copies of the flash analysis are enclosed.

Working and breathing losses for produced water tanks were estimated using EPA Tanks, version 4.09d with the pre-loaded Crude Oil RVP 5 parameters. Working and breathing losses for produced water were assumed to be 1% of those represented for Crude Oil RVP 5. A text file showing results of the EPA Tanks analysis are enclosed.

SElephantWT_W&S.txt
TANKS 4.0 Report <!-- function StartUp() { var DataSource=new ActiveXObject("microsoft.xmlDOM"); DataSource.load("summarydata.xml"); var XslStyle=new ActiveXObject("microsoft.xmlDOM"); XslStyle.load("summary.xsl");

document.all.item("xslcontainer").innerHTML=DataSource.transformNode(XslStyle.documentElement);
} //--> TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
User Identification:Phantom WC Prod Water
City:Midland-Odessa
State:Texas
Company:Resolute
Type of Tank:Vertical Fixed Roof Tank
Description:W&S losses from produced water storage tanks.

Tank Dimensions
Shell Height (ft):16.00
Diameter (ft):21.50
Liquid Height (ft) :14.00
Avg. Liquid Height (ft):8.00
Volume (gallons):38,021.39
Turnovers:8,606.98
Net Throughput(gal/yr):327,249,510.00
Is Tank Heated (y/n):N

Paint Characteristics
Shell Color/Shade:Gray/Light
Shell Condition:Good
Roof Color/Shade:Gray/Light
Roof Condition:Good

Roof Characteristics
Type:Cone

SElephantWT_W&S.txt

Height (ft)1.00

Slope (ft/ft) (Cone Roof)0.09

Breather Vent Settings

Vacuum Settings (psig):-0.03

Pressure Settings (psig)0.03

Meteorological Data used in Emissions Calculations: Midland-Odessa, Texas
(Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

Phantom WC Prod Water - Vertical Fixed Roof Tank

Midland-Odessa, Texas

Daily Liquid Surf.

Temperature (deg F)Liquid

Bulk

Temp Vapor Pressure (psia)Vapor

Mol. Liquid

Mass Vapor

Mass Mol. Basis for Vapor Pressure

Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.

Fract. Weight Calculations

Crude oil (RVP 5)A1171.7460.3383.1565.52 3.60542.89644.446950.0000

207.00 Option 4: RVP=5

TANKS 4.0.9d

Emissions Report - Detail Format

Detail Calculations (AP-42)

SElephantWT_W&S.txt
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Annual Emission Calculations

Standing Losses (lb):3,230.5360
Vapor Space Volume (cu ft):3,025.4192
Vapor Density (lb/cu ft):0.0316
Vapor Space Expansion Factor:0.2399
Vented Vapor Saturation Factor:0.3857

Tank Vapor Space Volume:

Vapor Space Volume (cu ft):3,025.4192
Tank Diameter (ft):21.5000
Vapor Space Outage (ft):8.3333
Tank Shell Height (ft):16.0000
Average Liquid Height (ft):8.0000
Roof Outage (ft):0.3333

Roof Outage (Cone Roof)

Roof Outage (ft):0.3333
Roof Height (ft):1.0000
Roof Slope (ft/ft):0.0900
Shell Radius (ft):10.7500

Vapor Density

Vapor Density (lb/cu ft):0.0316
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia):3.6054
Daily Avg. Liquid Surface Temp. (deg. R):531.4068
Daily Average Ambient Temp. (deg. F):63.2750
Ideal Gas Constant R
(psia cuft / (lb-mol-deg R)):10.731
Liquid Bulk Temperature (deg. R):525.1850
Tank Paint Solar Absorptance (Shell):0.5400
Tank Paint Solar Absorptance (Roof):0.5400
Daily Total Solar Insulation
Factor (Btu/sqft day):1,689.4892

Vapor Space Expansion Factor
Vapor Space Expansion Factor:0.2399

SElephantWT_W&S.txt

Daily Vapor Temperature Range (deg. R):45.6331
Daily Vapor Pressure Range (psia):1.5505
Breather Vent Press. Setting Range(psia):0.0600
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Vapor Pressure at Daily Minimum Liquid
 Surface Temperature (psia):2.8964
Vapor Pressure at Daily Maximum Liquid
 Surface Temperature (psia):4.4469
Daily Avg. Liquid Surface Temp. (deg R):531.4068
Daily Min. Liquid Surface Temp. (deg R):519.9985
Daily Max. Liquid Surface Temp. (deg R):542.8150
Daily Ambient Temp. Range (deg. R):27.9000

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor:0.3857
Vapor Pressure at Daily Average Liquid:
 Surface Temperature (psia):3.6054
Vapor Space Outage (ft):8.3333

Working Losses (lb):179,248.5046
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Annual Net Throughput (gal/yr.):327,249,510.0000
Annual Turnovers:8,606.9835
Turnover Factor:0.1702
Maximum Liquid Volume (gal):38,021.3938
Maximum Liquid Height (ft):14.0000
Tank Diameter (ft):21.5000
Working Loss Product Factor:0.7500

Total Losses (lb):182,479.0406

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

SElephantWT_W&S.txt

Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	179,248.50	3,230.54	182,479.04

NORTH BRONCO WT-1

Water Production	5,405 bbls/day
Sample Pressure	60 psig
Sample Temperature	140 °F
Gas/Water Ratio	0.42 scf/bbl
	2,270 scf/day
Vapor	2.2701 mscfd
	829 mscf/year
VOC/unit gas volume	18.66 lbs/mscf
VOC	7.7 TPY
W&B VOC from EPA Tanks	0.4 TPY
TOTAL VOC	8.1 TPY

Produced water flashing emissions were estimated using a representative laboratory flash analysis of produced water. Copies of the flash analysis are enclosed.

Working and breathing losses for produced water tanks were estimated using EPA Tanks, version 4.09d with the pre-loaded Crude Oil RVP 5 parameters. Working and breathing losses for produced water were assumed to be 1% of those represented for Crude Oil RVP 5. A text file showing results of the EPA Tanks analysis are enclosed.

NBroncoWT_W&S.txt
TANKS 4.0 Report <!-- function StartUp() { var DataSource=new ActiveXObject("microsoft.xmlDOM"); DataSource.load("summarydata.xml"); var XslStyle=new ActiveXObject("microsoft.xmlDOM"); XslStyle.load("summary.xsl");

document.all.item("xslcontainer").innerHTML=DataSource.transformNode(XslStyle.documentElement);
} //-->
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
User Identification:Phantom WC Prod Water
City:Midland-Odessa
State:Texas
Company:Resolute
Type of Tank:Vertical Fixed Roof Tank
Description:W&S losses from produced water storage tanks.

Tank Dimensions
Shell Height (ft):16.00
Diameter (ft):21.50
Liquid Height (ft) :14.00
Avg. Liquid Height (ft):8.00
Volume (gallons):38,021.39
Turnovers:3,128.79
Net Throughput(gal/yr):118,960,800.00
Is Tank Heated (y/n):N

Paint Characteristics
Shell Color/Shade:Gray/Light
Shell Condition:Good
Roof Color/Shade:Gray/Light
Roof Condition:Good

Roof Characteristics
Type:Cone

NBroncoWT_W&S.txt

Height (ft)1.00
Slope (ft/ft) (Cone Roof)0.09

Breather Vent Settings
Vacuum Settings (psig):-0.03
Pressure Settings (psig)0.03

Meteorological Data used in Emissions Calculations: Midland-Odessa, Texas
(Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Daily Liquid Surf.
Temperature (deg F)Liquid
Bulk
Temp Vapor Pressure (psia)Vapor
Mol. Liquid
Mass Vapor
Mass Mol. Basis for Vapor Pressure
Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.
Fract. Weight Calculations

Crude oil (RVP 5)A1171.7460.3383.1565.52 3.60542.89644.446950.0000
207.00 Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

NBroncoWT_W&S.txt
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Annual Emission Calculations

Standing Losses (lb):3,230.5360
Vapor Space Volume (cu ft):3,025.4192
Vapor Density (lb/cu ft):0.0316
Vapor Space Expansion Factor:0.2399
Vented Vapor Saturation Factor:0.3857

Tank Vapor Space Volume:

Vapor Space Volume (cu ft):3,025.4192
Tank Diameter (ft):21.5000
Vapor Space Outage (ft):8.3333
Tank Shell Height (ft):16.0000
Average Liquid Height (ft):8.0000
Roof Outage (ft):0.3333

Roof Outage (Cone Roof)

Roof Outage (ft):0.3333
Roof Height (ft):1.0000
Roof Slope (ft/ft):0.0900
Shell Radius (ft):10.7500

Vapor Density

Vapor Density (lb/cu ft):0.0316
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia):3.6054
Daily Avg. Liquid Surface Temp. (deg. R):531.4068
Daily Average Ambient Temp. (deg. F):63.2750
Ideal Gas Constant R
(psia cuft / (lb-mol-deg R)):10.731
Liquid Bulk Temperature (deg. R):525.1850
Tank Paint Solar Absorptance (Shell):0.5400
Tank Paint Solar Absorptance (Roof):0.5400
Daily Total Solar Insulation
Factor (Btu/sqft day):1,689.4892

Vapor Space Expansion Factor

Vapor Space Expansion Factor:0.2399

NBroncoWT_W&S.txt

Daily Vapor Temperature Range (deg. R):45.6331
Daily Vapor Pressure Range (psia):1.5505
Breather Vent Press. Setting Range(psia):0.0600
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Vapor Pressure at Daily Minimum Liquid
 Surface Temperature (psia):2.8964
Vapor Pressure at Daily Maximum Liquid
 Surface Temperature (psia):4.4469
Daily Avg. Liquid Surface Temp. (deg R):531.4068
Daily Min. Liquid Surface Temp. (deg R):519.9985
Daily Max. Liquid Surface Temp. (deg R):542.8150
Daily Ambient Temp. Range (deg. R):27.9000

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor:0.3857
Vapor Pressure at Daily Average Liquid:
 Surface Temperature (psia):3.6054
Vapor Space Outage (ft):8.3333

Working Losses (lb):67,496.9879

Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Annual Net Throughput (gal/yr.):118,960,800.0000
Annual Turnovers:3,128.7859
Turnover Factor:0.1763
Maximum Liquid Volume (gal):38,021.3938
Maximum Liquid Height (ft):14.0000
Tank Diameter (ft):21.5000
Working Loss Product Factor:0.7500

Total Losses (lb):70,727.5239

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

NBroncoWT_W&S.txt

Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	67,496.99	30.54	727.52

SOUTH BRONCO WT-1

Water Production	4,766 bbls/day
Sample Pressure	60 psig
Sample Temperature	140 °F
Gas/Water Ratio	0.42 scf/bbl
	2,002 scf/day
Vapor	2.00172 mscfd
	731 mscf/year
VOC/unit gas volume	18.66 lbs/mscf
VOC	6.8 TPY
W&B VOC from EPA Tanks	0.4 TPY
TOTAL VOC	7.2 TPY

Produced water flashing emissions were estimated using a representative laboratory flash analysis of produced water. Copies of the flash analysis are enclosed.

Working and breathing losses for produced water tanks were estimated using EPA Tanks, version 4.09d with the pre-loaded Crude Oil RVP 5 parameters. Working and breathing losses for produced water were assumed to be 1% of those represented for Crude Oil RVP 5. A text file showing results of the EPA Tanks analysis are enclosed.

SBroncoWT_W&S.txt
TANKS 4.0 Report <!-- function StartUp() { var DataSource=new ActiveXObject("microsoft.xmlDOM"); DataSource.load("summarydata.xml"); var XslStyle=new ActiveXObject("microsoft.xmlDOM"); XslStyle.load("summary.xsl");

document.all.item("xslcontainer").innerHTML=DataSource.transformNode(XslStyle.documentElement);
} //-->
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
User Identification: Phantom WC Prod Water
City: Midland-Odessa
State: Texas
Company: Resolute
Type of Tank: Vertical Fixed Roof Tank
Description: W&S losses from produced water storage tanks.

Tank Dimensions
Shell Height (ft): 16.00
Diameter (ft): 21.50
Liquid Height (ft) : 14.00
Avg. Liquid Height (ft): 8.00
Volume (gallons): 38,021.39
Turnovers: 3,128.79
Net Throughput(gal/yr): 127,055,040.00
Is Tank Heated (y/n): N

Paint Characteristics
Shell Color/Shade: Gray/Light
Shell Condition: Good
Roof Color/Shade: Gray/Light
Roof Condition: Good

Roof Characteristics
Type: Cone

SBroncoWT_W&S.txt

Height (ft)1.00
Slope (ft/ft) (Cone Roof)0.09

Breather Vent Settings
Vacuum Settings (psig):-0.03
Pressure Settings (psig)0.03

Meteorological Data used in Emissions Calculations: Midland-Odessa, Texas
(Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Daily Liquid Surf.
Temperature (deg F)Liquid
Bulk
Temp Vapor Pressure (psia)Vapor
Mol. Liquid
Mass Vapor
Mass Mol. Basis for Vapor Pressure
Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.
Fract. Weight Calculations

Crude oil (RVP 5)All171.7460.3383.1565.52 3.60542.89644.446950.0000
207.00 Option 4: RVP=5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

SBroncowT_W&S.txt
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Annual Emission Calculations

Standing Losses (lb):3,230.5360
Vapor Space Volume (cu ft):3,025.4192
Vapor Density (lb/cu ft):0.0316
Vapor Space Expansion Factor:0.2399
Vented Vapor Saturation Factor:0.3857

Tank Vapor Space Volume:

Vapor Space Volume (cu ft):3,025.4192
Tank Diameter (ft):21.5000
Vapor Space Outage (ft):8.3333
Tank Shell Height (ft):16.0000
Average Liquid Height (ft):8.0000
Roof Outage (ft):0.3333

Roof Outage (Cone Roof)

Roof Outage (ft):0.3333
Roof Height (ft):1.0000
Roof Slope (ft/ft):0.0900
Shell Radius (ft):10.7500

Vapor Density

Vapor Density (lb/cu ft):0.0316
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia):3.6054
Daily Avg. Liquid Surface Temp. (deg. R):531.4068
Daily Average Ambient Temp. (deg. F):63.2750
Ideal Gas Constant R
(psia cuft / (lb-mol-deg R)):10.731
Liquid Bulk Temperature (deg. R):525.1850
Tank Paint Solar Absorptance (Shell):0.5400
Tank Paint Solar Absorptance (Roof):0.5400
Daily Total Solar Insulation
Factor (Btu/sqft day):1,689.4892

Vapor Space Expansion Factor

Vapor Space Expansion Factor:0.2399

SBroncoWT_W&S.txt

Daily Vapor Temperature Range (deg. R):45.6331
Daily Vapor Pressure Range (psia):1.5505
Breather Vent Press. Setting Range(psia):0.0600
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Vapor Pressure at Daily Minimum Liquid
 Surface Temperature (psia):2.8964
Vapor Pressure at Daily Maximum Liquid
 Surface Temperature (psia):4.4469
Daily Avg. Liquid Surface Temp. (deg R):531.4068
Daily Min. Liquid Surface Temp. (deg R):519.9985
Daily Max. Liquid Surface Temp. (deg R):542.8150
Daily Ambient Temp. Range (deg. R):27.9000

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor:0.3857
Vapor Pressure at Daily Average Liquid:
 Surface Temperature (psia):3.6054
Vapor Space Outage (ft):8.3333

Working Losses (lb):72,089.5665
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Annual Net Throughput (gal/yr.):127,055,040.0000
Annual Turnovers:3,128.7859
Turnover Factor:0.1763
Maximum Liquid Volume (gal):38,021.3938
Maximum Liquid Height (ft):14.0000
Tank Diameter (ft):21.5000
Working Loss Product Factor:0.7500

Total Losses (lb):75,320.1025

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

SBroncowT_W&S.txt

Components	Losses(lbs)	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)		72,089.57	3,230.54	75,320.10

NORTH GOAT WT-1

Water Production	1,706 bbls/day
Sample Pressure	65 psig
Sample Temperature	118 °F
Gas/Water Ratio	0.93 scf/bbl
	1,587 scf/day
Vapor	1.58658 mscfd
	579 mscf/year
VOC/unit gas volume	23.39 lbs/mscf
VOC	6.8 TPY
W&B VOC from EPA Tanks	0.3 TPY
TOTAL VOC	7.0 TPY

Produced water flashing emissions were estimated using a representative laboratory flash analysis of produced water. Copies of the flash analysis are enclosed.

Working and breathing losses for produced water tanks were estimated using EPA Tanks, version 4.09d with the pre-loaded Crude Oil RVP 5 parameters. Working and breathing losses for produced water were assumed to be 1% of those represented for Crude Oil RVP 5. A text file showing results of the EPA Tanks analysis are enclosed.

NGoatWT_W&S.txt

```
TANKS 4.0 Report <!-- function StartUp() { var DataSource=new
ActiveXObject("microsoft.xmlDOM"); DataSource.load("summarydata.xml"); var
XslStyle=new ActiveXObject("microsoft.xmlDOM"); XslStyle.load("summary.xsl");

document.all.item("xslcontainer").innerHTML=DataSource.transformNode(XslStyle.docume
ntElement);
} //-->
TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics
```

Identification

User Identification: Phantom WC Prod Water

City: Midland-Odessa

State: Texas

Company: Resolute

Type of Tank: Vertical Fixed Roof Tank

Description: W&S losses from produced water storage tanks.

Tank Dimensions

Shell Height (ft): 16.00

Diameter (ft): 21.50

Liquid Height (ft) : 14.00

Avg. Liquid Height (ft): 8.00

Volume (gallons): 38,021.39

Turnovers: 2,255.87

Net Throughput(gal/yr): 85,771,350.00

Is Tank Heated (y/n): N

Paint Characteristics

Shell Color/Shade: Gray/Light

Shell Condition: Good

Roof Color/Shade: Gray/Light

Roof Condition: Good

Roof Characteristics

Type: Cone

NGoatWT_W&S.txt

Height (ft)1.00

Slope (ft/ft) (Cone Roof)0.09

Breather Vent Settings

Vacuum Settings (psig):-0.03

Pressure Settings (psig)0.03

Meteorological Data used in Emissions Calculations: Midland-Odessa, Texas
(Avg Atmospheric Pressure = 13.28 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

Phantom WC Prod Water - Vertical Fixed Roof Tank

Midland-Odessa, Texas

Daily Liquid Surf.

Temperature (deg F)Liquid

Bulk

Temp Vapor Pressure (psia)Vapor

Mol. Liquid

Mass Vapor

Mass Mol. Basis for Vapor Pressure

Mixture/ComponentMonthAvg.Min.Max.(deg F) Avg.Min.Max.Weight. Fract.

Fract. Weight Calculations

Crude oil (RVP 5)All171.7460.3383.1565.52 3.60542.89644.446950.0000
207.00 Option 4: RVP=5

TANKS 4.0.9d

Emissions Report - Detail Format

Detail Calculations (AP-42)

NGoatWT_W&S.txt
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

Annual Emission Calculations

Standing Losses (lb):3,230.5360
Vapor Space Volume (cu ft):3,025.4192
Vapor Density (lb/cu ft):0.0316
Vapor Space Expansion Factor:0.2399
Vented Vapor Saturation Factor:0.3857

Tank Vapor Space Volume:

Vapor Space Volume (cu ft):3,025.4192
Tank Diameter (ft):21.5000
Vapor Space Outage (ft):8.3333
Tank Shell Height (ft):16.0000
Average Liquid Height (ft):8.0000
Roof Outage (ft):0.3333

Roof Outage (Cone Roof)

Roof Outage (ft):0.3333
Roof Height (ft):1.0000
Roof Slope (ft/ft):0.0900
Shell Radius (ft):10.7500

Vapor Density

Vapor Density (lb/cu ft):0.0316
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia):3.6054
Daily Avg. Liquid Surface Temp. (deg. R):531.4068
Daily Average Ambient Temp. (deg. F):63.2750
Ideal Gas Constant R
(psia cuft / (lb-mol-deg R)):10.731
Liquid Bulk Temperature (deg. R):525.1850
Tank Paint Solar Absorptance (Shell):0.5400
Tank Paint Solar Absorptance (Roof):0.5400
Daily Total Solar Insulation
Factor (Btu/sqft day):1,689.4892

Vapor Space Expansion Factor
Vapor Space Expansion Factor:0.2399

NGoatWT_W&S.txt

Daily Vapor Temperature Range (deg. R):45.6331
Daily Vapor Pressure Range (psia):1.5505
Breather Vent Press. Setting Range(psia):0.0600
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Vapor Pressure at Daily Minimum Liquid
 Surface Temperature (psia):2.8964
Vapor Pressure at Daily Maximum Liquid
 Surface Temperature (psia):4.4469
Daily Avg. Liquid Surface Temp. (deg R):531.4068
Daily Min. Liquid Surface Temp. (deg R):519.9985
Daily Max. Liquid Surface Temp. (deg R):542.8150
Daily Ambient Temp. Range (deg. R):27.9000

Vented Vapor Saturation Factor

Vented Vapor Saturation Factor:0.3857
Vapor Pressure at Daily Average Liquid:
 Surface Temperature (psia):3.6054
Vapor Space Outage (ft):8.3333

Working Losses (lb):49,690.1112
Vapor Molecular Weight (lb/lb-mole):50.0000
Vapor Pressure at Daily Average Liquid
 Surface Temperature (psia):3.6054
Annual Net Throughput (gal/yr.):85,771,350.0000
Annual Turnovers:2,255.8707
Turnover Factor:0.1800
Maximum Liquid Volume (gal):38,021.3938
Maximum Liquid Height (ft):14.0000
Tank Diameter (ft):21.5000
Working Loss Product Factor:0.7500

Total Losses (lb):52,920.6472

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

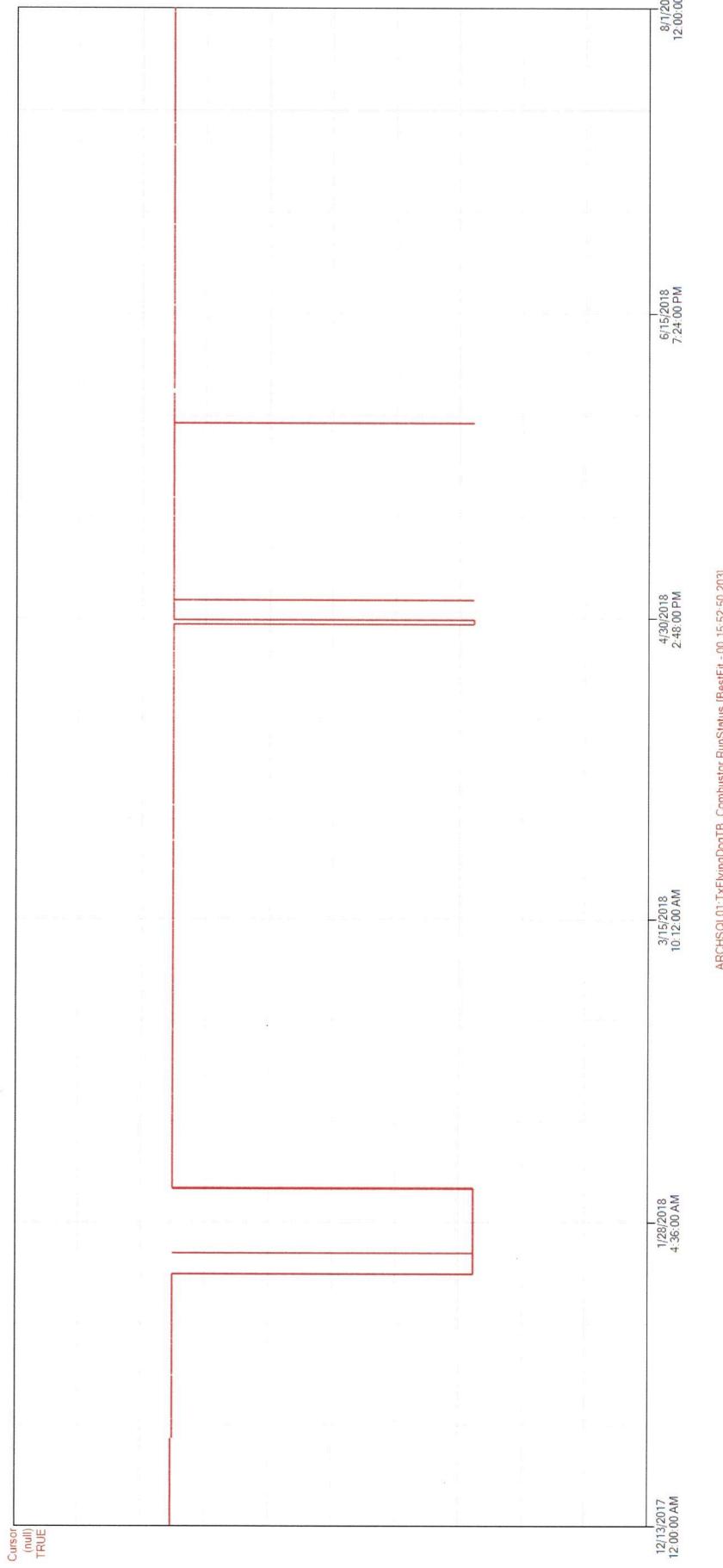
Phantom WC Prod Water - Vertical Fixed Roof Tank
Midland-Odessa, Texas

NGoatWT_W&S.txt

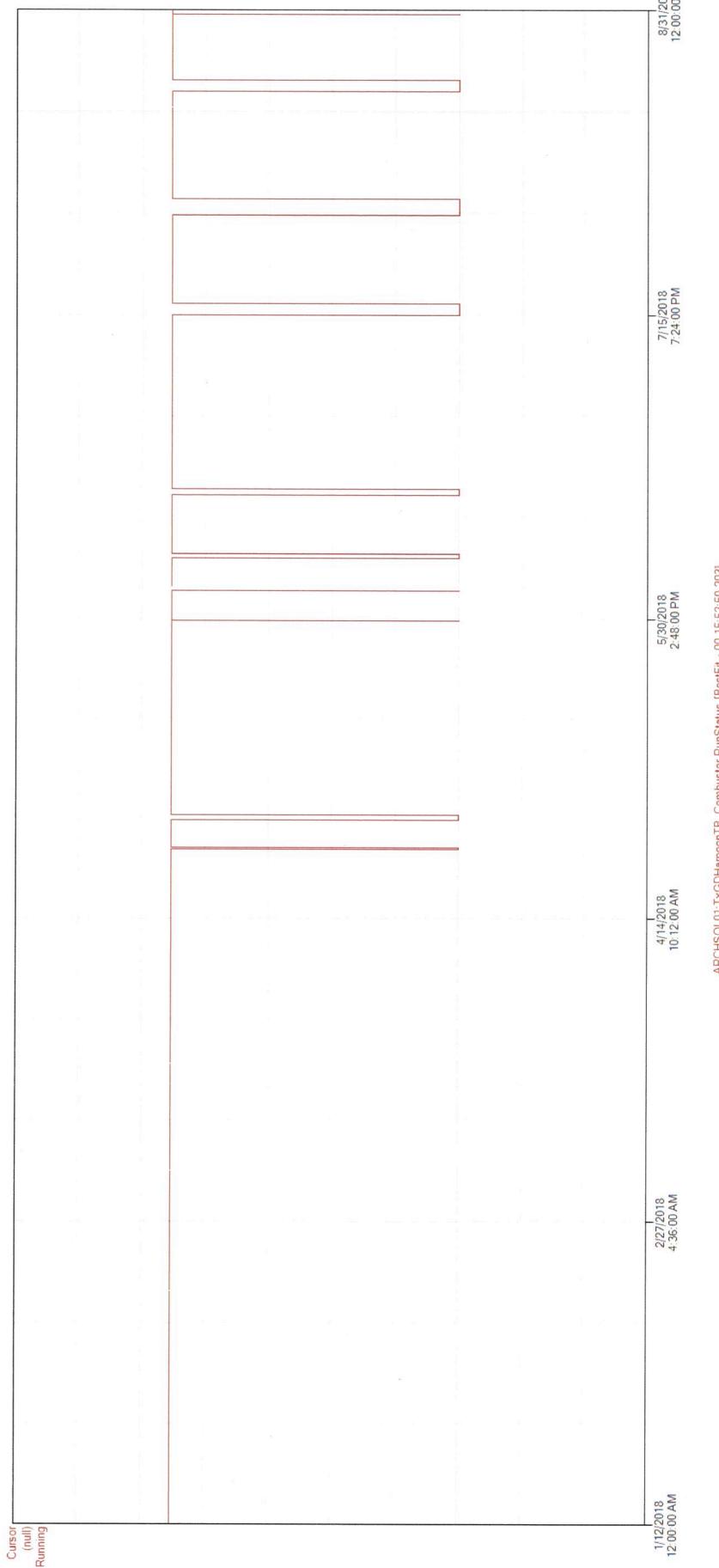
Components	Losses(lbs)	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	49,690.113,230.545	2,920.65		

APPENDIX 4b
Combustion Device Pilot Monitoring

Flying Dog_Iron City Pilot



Harpoon Pilot



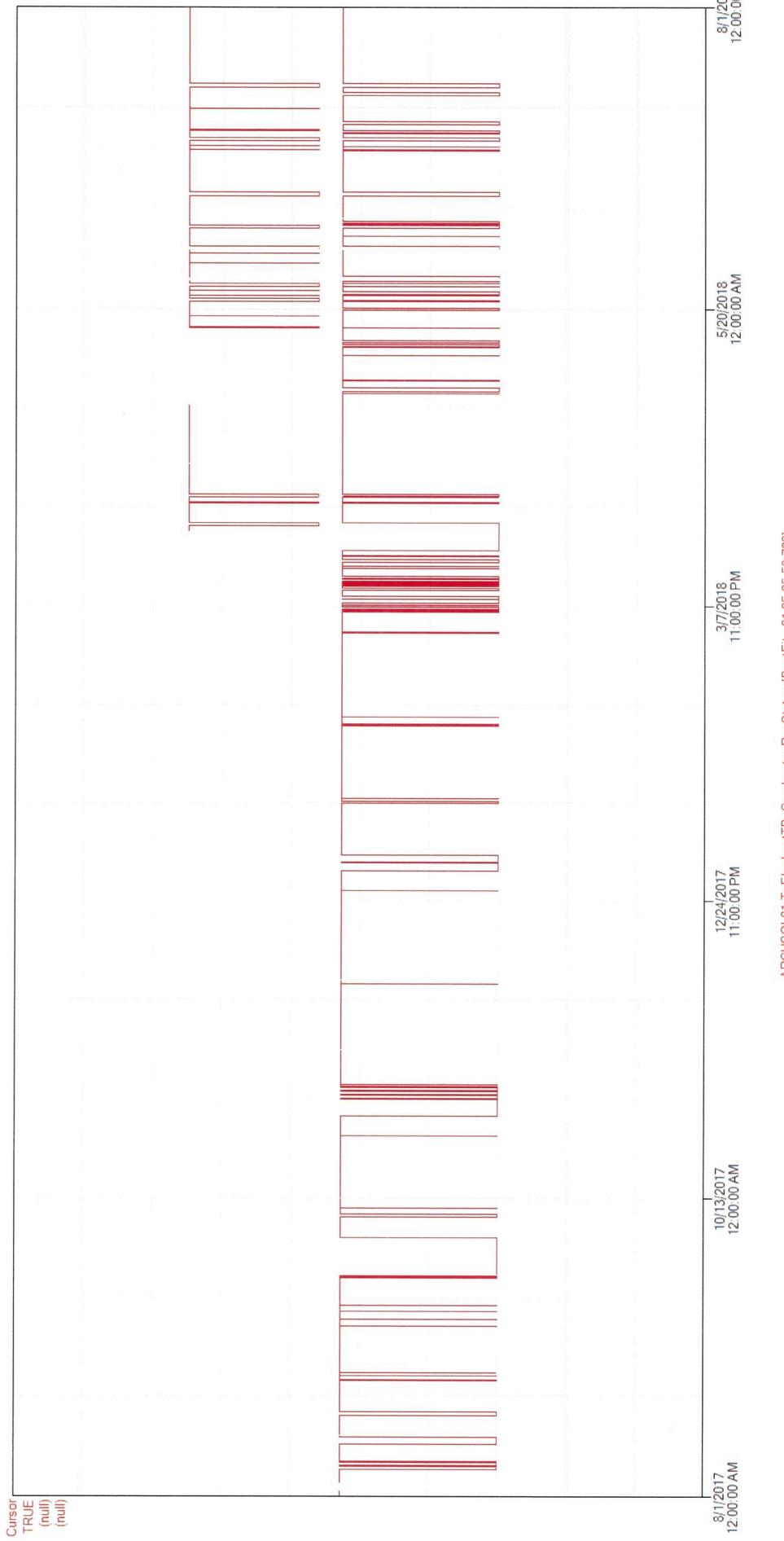
Harrison Pilot

Cursor
TRUE
(null)

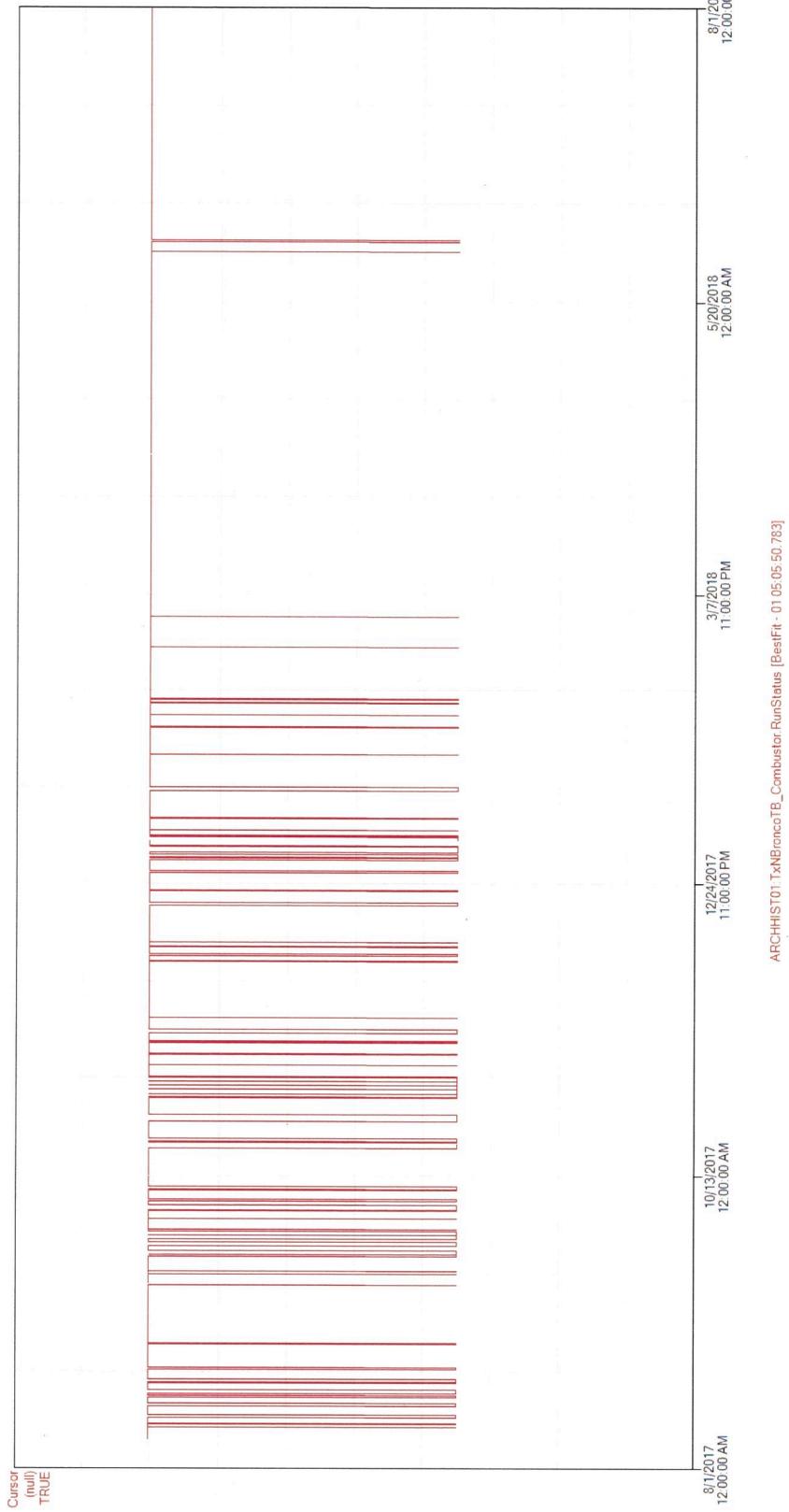
ARCHHIST01:TxHarrisonTB_Combustor.RunStatus [BestFit - 00 18:29:29 362]

12/12/2017 12:00:00 AM 1/27/2018 9:24:00 AM 3/14/2018 7:48:00 PM 4/30/2018 5:12:00 AM 6/15/2018 2:36:00 PM 8/1/2018 12:00:00 AM

Elephant Pilots



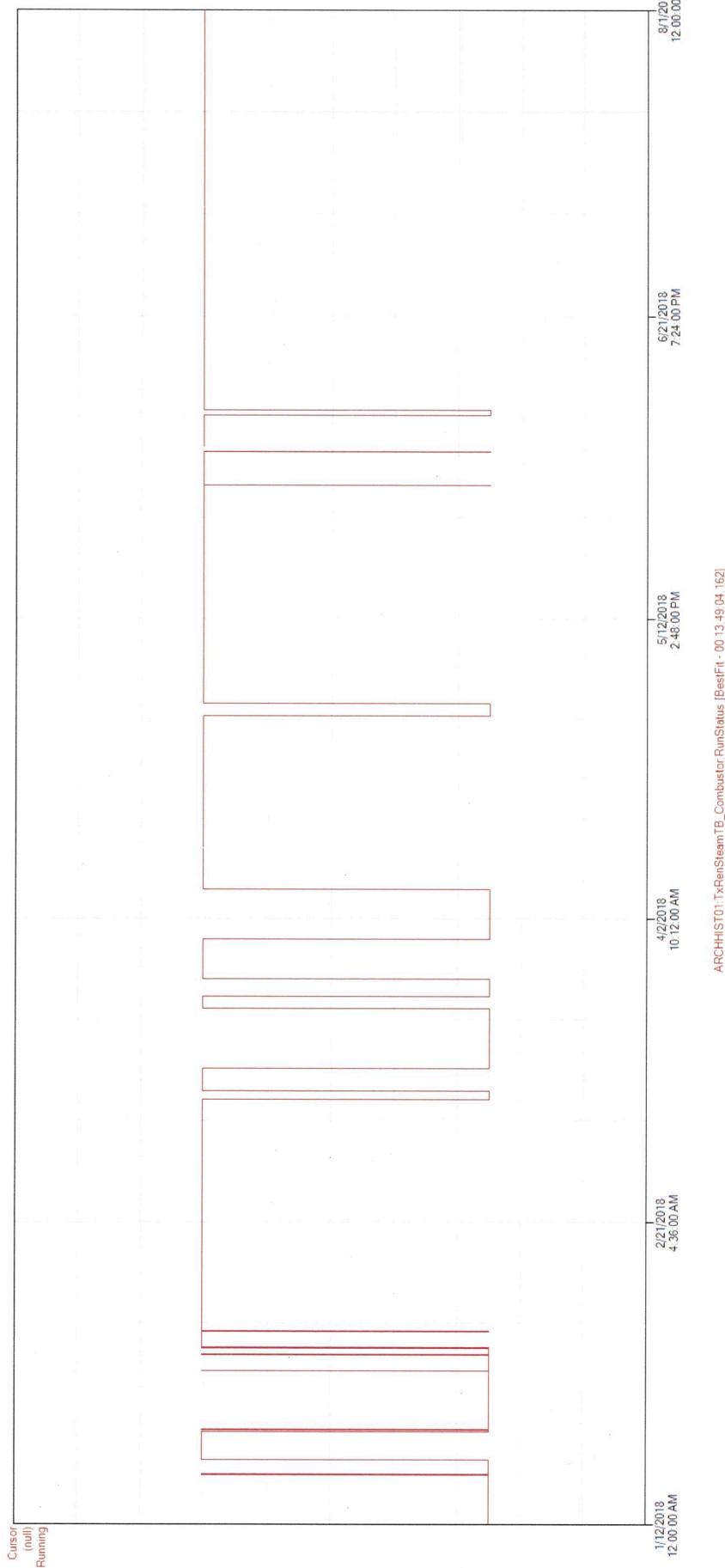
North Bronco Pilot



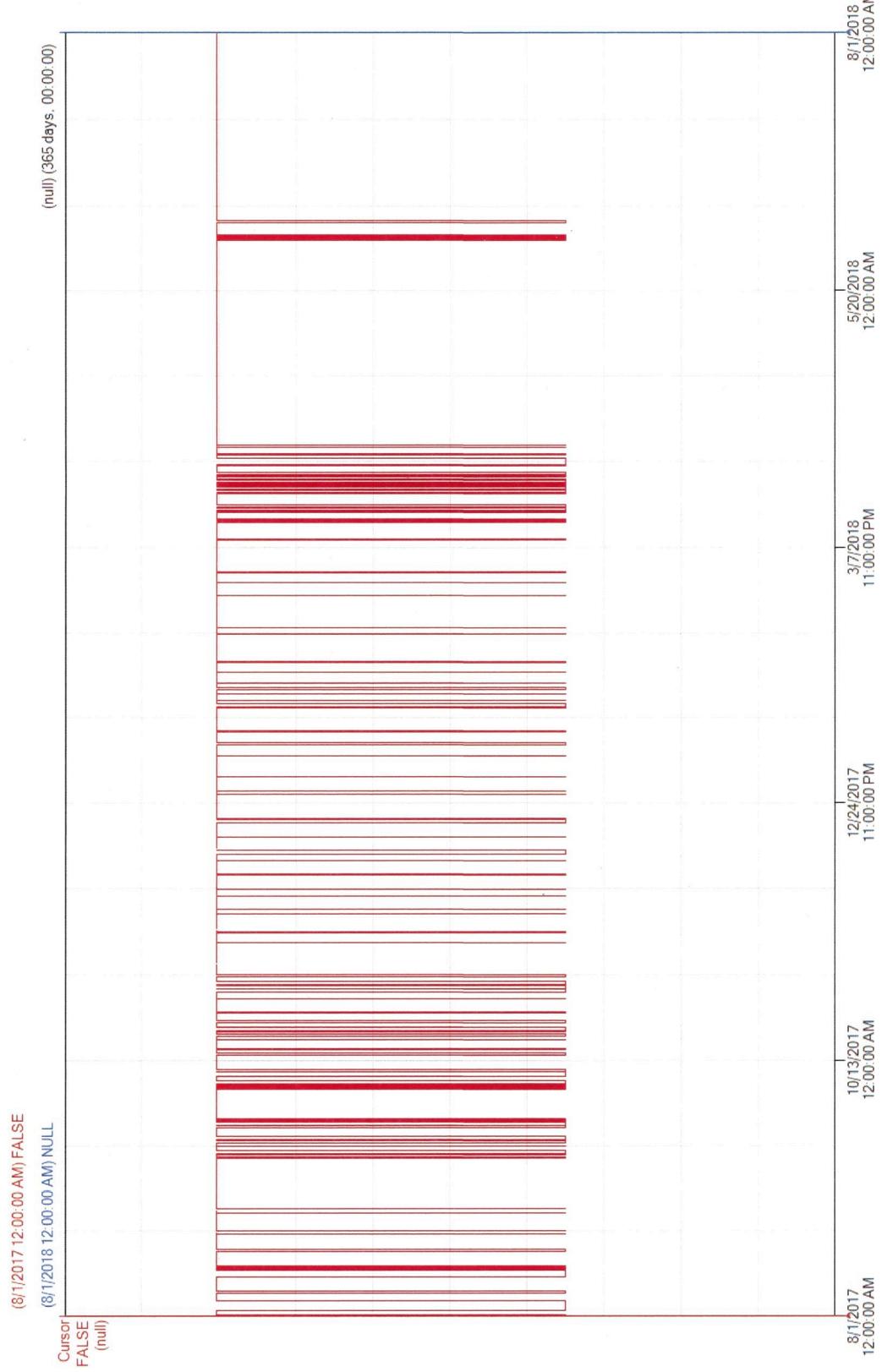
12/3/2018 1:35:18 PM

C:\Users\DMallory\Desktop\Trends\North Bronco Pilot\aaTrend

RenSteam_Pilot



South Bronco Pilot



ARCHSQL01:\TxSBronco\TB_Combustor\RunStatus [BestFit - 01 13:27:13.459]

North Goat Pilot

APPENDIX 5
Fugitive Emissions Component Monitoring

Facility ID	Date of LDAR Survey	Survey End Time	Name of Surveyor	Ambient Temperature	Sky Condition	Max Wind Speed	Monitoring Instrument From Monitoring Plan	Deviations from Monitoring Plan	Type of Component for which Fugitive Emissions Detected	Number of Each Component Type Not Repaired as Required	Number of Each Component Type Not Repaired as Required	Difficult-to-Monitor Components Monitored	Unsafe-to-Monitor Component Monitored	Date of Successful Repair of Fugitive Emissions Component Placed on Delay of Repair List	Type of Component Placed on Delay of Repair List	Explanation for Delay of Repair	Instrument Used to Resurvey Repaired Components	Training and Experience of Surveyor
Harrison State Battery	11/6/2017	1:20 PM	1:27 PM Brandon Cohorn	75°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	1, 4	Thief Hatch	4	None	11/24/17, 2/13/18 Thief Hatch	4 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
North Elephant Battery	11/6/2017	1:47 PM	2:00 PM Brandon Cohorn	87°F	Clear	5 mph	FLIR GF320 OGI Camera	None	PRD	3 PRD	2 None	None	None	11/27/17, 2/8/18 PRD	2 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
South Elephant Battery	11/6/2017	1:47 PM	2:00 PM Brandon Cohorn	87°F	Clear	5 mph	FLIR GF320 OGI Camera	None	Connectors, PRD, Thief Hatch	1, 3, 1	PRD, Thief Hatch	3, 1	None	11/28/2017, 2/8/2018, 1/5/2018 PRD, Thief Hatch	3, 1	Order parts	BWI PID	Field trained by FLIR certified personnel
North Bronco CS	11/6/2017	12:00 PM	12:10 PM Brandon Cohorn	80°F	Clear	10 mph	FLIR GF320 OGI Camera	None	Thief Hatch	2	None	0 None	None	11/15/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
North Bronco TB	11/6/2017	11:48 AM	12:00 PM Brandon Cohorn	75°F	Clear	0.8 mph	FLIR GF320 OGI Camera	None	Thief Hatch	1	None	0 None	None	11/14/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Ranger Battery	11/6/2017	8:10 AM	8:30 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	Thief Hatch	1	None	0 None	None	11/14/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Queen City Battery	11/6/2017	2:36 PM	2:55 PM Brandon Cohorn	82°F	Clear	5.6 mph	FLIR GF320 OGI Camera	None	Thief Hatch	1	None	0 None	None	11/24/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
North Goat Battery	11/6/2017	9:05 AM	9:10 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	PRD	1	None	0 None	None	11/22/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
North Mite Battery	11/6/2017	9:00 AM	9:05 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	Connectors, PRD	1, 3	PRD	3 None	None	11/22/17, 2/13/18 PRD	3 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
South Goat Battery	11/6/2017	9:15 AM	9:25 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	PRD	3	None	0 None	None	11/21/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
South Mite Battery	11/6/2017	9:10 AM	9:15 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	PRD	1	None	0 None	None	11/28/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
South Bronco TB	11/6/2017	10:30 AM	10:45 AM Brandon Cohorn	65°F	Clear	1.8 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	4, 1	None	None	None	11/16/2017, 1/17/2018, 2/5/2018 PRD, Thief Hatch	2, 1	Order parts	BWI PID	Field trained by FLIR certified personnel
South Bronco CS	11/6/2017	10:55 AM	11:00 AM Brandon Cohorn	75°F	Clear	5.4 mph	FLIR GF320 OGI Camera	None	Thief Hatch, Pressure, 1, 3	None	None	0 None	None	11/23/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Ace/Breckenridge Battery	11/7/2017	12:34 PM	12:44 PM Brandon Cohorn	81°F	Clear	6.3 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	2, 1	None	0 None	None	11/25/17, 11/25/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Boucher/Junta Battery	11/7/2017	3:33 PM	3:45 PM Brandon Cohorn	76°F	Clear	7.9 mph	FLIR GF320 OGI Camera	None	Connector, PRD, Thief Hatch	1, 2, 1	None	0 None	None	0 NA	BWI PID	Field trained by FLIR certified personnel		
Flying Dog Battery	11/7/2017	11:00 AM	11:30 AM Brandon Cohorn	78°F	Clear	9.7 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	4, 3	PRD	1 None	None	11/15/17, 1/6/18 PRD	1 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
Iron City Battery	11/7/2017	11:00 AM	11:30 AM Brandon Cohorn	78°F	Clear	9.7 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	4, 3	None	None	None	1/7/18, 2/13/18 PRD, Thief Hatch	4, 3	Order replacement parts	BWI PID	Field trained by FLIR certified personnel
Harpoon Battery	11/7/2017	10:37 AM	10:46 AM Brandon Cohorn	75°F	Clear	8.3 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	5, 2	PRD	3 None	None	11/15/17, 1/6/18 PRD	3 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
Great Divide Battery	11/7/2017	10:37 AM	10:46 AM Brandon Cohorn	75°F	Clear	8.3 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	3, 2	PRD	3 None	None	11/15/17, 1/6/18 PRD	3 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
Jolly/Long Yuengling Battery	11/7/2017	9:59 AM	10:12 AM Brandon Cohorn	68°F	Clear	8.5 mph	FLIR GF320 OGI Camera	None	Connectors	2	None	0 None	None	11/21/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Pipeworks Battery	11/7/2017	2:09 PM	2:30 PM Brandon Cohorn	82°F	Clear	4.3 mph	FLIR GF320 OGI Camera	None	PRD	2	None	0 None	None	11/16/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Thunder Canyon Battery	11/7/2017	2:09 PM	2:30 PM Brandon Cohorn	82°F	Clear	4.3 mph	FLIR GF320 OGI Camera	None	PRD, Thief Hatch	2, 5	Thief Hatch	5 None	None	11/22/2017, 2/2/2018 Thief Hatch	5 Order replacement parts	BWI PID	Field trained by FLIR certified personnel	
Renegade Battery	11/7/2017	2:36 PM	2:55 PM Brandon Cohorn	82°F	Clear	5.7 mph	FLIR GF320 OGI Camera	None	Thief Hatch	2	None	0 None	None	11/21/2017 None	0 NA	BWI PID	Field trained by FLIR certified personnel	
Steamworks Battery	11/7/2017	2:36 PM	2:55 PM Brandon Cohorn	82°F	Clear	5.7 mph	FLIR GF320 OGI Camera	None	None	0 None	None	0 None	None	NA	NA	Field trained by FLIR certified personnel		
Harrison State Battery	4/11/2018	2:19 PM	2:35 PM Aaron Williamson	85°F	Clear	7.2 mph	FLIR GF320 OGI Camera	None	None	0 None	None	0 None	None	NA	NA	Field trained by FLIR certified personnel		
North Elephant Battery	4/11/2018	11:15 AM	11:35 AM Aaron Williamson	80°F	Clear	3.3 mph	FLIR GF320 OGI Camera	None	None	0 None	None	0 None	None	NA	NA	Field trained by FLIR certified personnel		
South Elephant Battery	4/11/2018	11:16 AM	11:36 AM Aaron Williamson	80°F	Clear	3.3 mph	FLIR GF320 OGI Camera	None	Connectors	2 None	None	0 None	None	0 NA	BWI PID	Field trained by FLIR certified personnel		

LDAR														
Facility ID	Date of LDAR Survey	Survey Begin Time	Survey End Time	Name of Surveyor	Ambient Temperature	Sky Condition	Max Wind Speed	Monitoring Instrument	Deviations From Monitoring Plan	Type of Component for which Fugitive Emissions Detected	Number of Each Component Type Not Repaired as Required	Type of Component Not Repaired as Required	Training and Experience of Surveyor	
North Bronco TB	4/11/2018	1:14 PM	1:31 PM	Aaron Williamson	85°F	Clear	8.2 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
North Bronco CS	4/11/2018	1:14 PM	1:31 PM	Aaron Williamson	85°F	Clear	8.2 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Ranger Battery	4/11/2018	10:15 AM	10:24 AM	Aaron Williamson	75°F	Clear	3.3 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
North Mite Battery	4/11/2018	10:26 AM	10:44 AM	Aaron Williamson	78°F	Clear	3.8 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
South Mite Battery	4/11/2018	10:26 AM	10:44 AM	Aaron Williamson	78°F	Clear	3.8 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
North Goat Battery	4/11/2018	10:26 AM	10:44 AM	Aaron Williamson	78°F	Clear	3.8 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
South Goat Battery	4/11/2018	10:26 AM	10:44 AM	Aaron Williamson	78°F	Clear	3.8 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
South Bronco TB	4/11/2018	12:28 PM	12:41 PM	Aaron Williamson	80°F	Clear	4.7 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
South Bronco CS	4/11/2018	12:28 PM	12:41 PM	Aaron Williamson	80°F	Clear	4.7 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Ace/Breckenridge Battery	4/12/2018	10:28 AM	10:33 AM	Aaron Williamson	80°F	Clear	17.2 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Boucher/Uinta Battery	4/12/2018	12:13 PM	12:28 PM	Aaron Williamson	76°F	Clear	7.9 mph	FLIR GF320 OGI Camera	None	1 None	0 None	4/18/2018	None	Field trained by FLIR certified personnel
Flying Dog Battery	4/12/2018	11:04 AM	11:30 AM	Aaron Williamson	85°F	Clear	19 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Iron City Battery	4/12/2018	11:04 AM	11:30 AM	Aaron Williamson	85°F	Clear	19 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Harpoon Battery	4/12/2018	10:37 AM	10:46 AM	Aaron Williamson	85°F	Clear	19 mph	FLIR GF320 OGI Camera	None	1 None	0 None	4/18/2018	None	Field trained by FLIR certified personnel
Great Divide Battery	4/12/2018	11:04 AM	11:30 AM	Aaron Williamson	85°F	Clear	19 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Jolly/Long Yuengling Battery	4/12/2018	11:45 AM	11:53 AM	Aaron Williamson	87°F	Clear	22.1 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Pipeworks Battery	4/12/2018	9:40 AM	9:49 AM	Aaron Williamson	71°F	Clear	19.9 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Thunder Canyon Battery	4/12/2018	9:40 AM	9:49 AM	Aaron Williamson	71°F	Clear	19.9 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel
Renegade Battery	4/12/2018	8:30 AM	9:40 AM	Aaron Williamson	71°F	Clear	19.9 mph	FLIR GF320 OGI Camera	None	3 None	0 None	4/17/2018	None	Field trained by FLIR certified personnel
Steamworks Battery	4/12/2018	8:30 AM	9:40 AM	Aaron Williamson	71°F	Clear	19.9 mph	FLIR GF320 OGI Camera	None	3 None	0 None	4/17/2018	None	Field trained by FLIR certified personnel
Queen City Battery	4/12/2018	8:30 AM	9:40 AM	Aaron Williamson	71°F	Clear	19.9 mph	FLIR GF320 OGI Camera	None	0 None	0 None	NA	NA	Field trained by FLIR certified personnel